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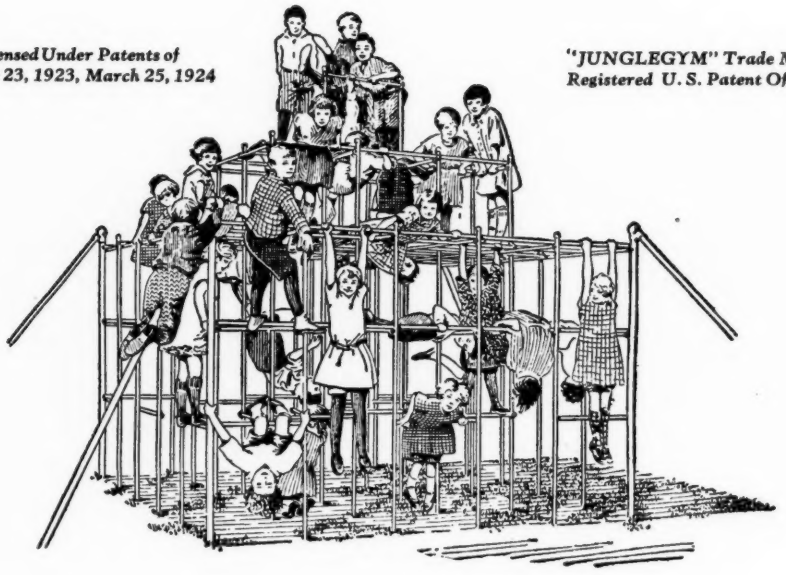

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Integrating Physical Education

By
NELLIE LEE HOLT
Director of Religious Education, Stephens College, Columbia, Mo.

"INTEGRATING Physical Education" is a very ambitious title, and whatever I have done to learn something of its meaning has been done through my association with Miss Wilma B. Haynes, Director of Physical Education at Stephens College. Both Miss Haynes and I felt that her field of Physical Education and my field of Religious Education suffered from bad reputations. Students interested in her work are too often called "tomboys" and students interested in my work are constantly called "sissies." Even our colleagues on the faculty thought of physical education as education for persons with brains in their hands and feet, and considered religious education as a transmission of superstitions, or at best a clever endoctrination.

Your whole trend in physical education seems to me to be a desire eventually to absorb mental hygiene. This objective is entirely reasonable. Physical education has always concerned itself with the physical well being of persons; why shouldn't it, then, concern itself as well with their mental well being? The new psychology contradicts the old Pauline—division of a human being into flesh and the spirit—and integrates the human being in the last analysis as a total person with tremendous emphasis on physical well being.

In many respects the training of physical education is superior to the training of other educators. First of all, the teacher of history or of English spends his major emphasis on his subject, not on his pupil. On the contrary, your major emphasis is on the study of the pupil and the development of his individual activity into the activity of a group. For that reason, your first interest is an interest in the personality of the child.

There is a need for your understanding of the child's person to be shared with the instructor who thinks of the child only as a student in his particular subject.

From all sides comes the problem of integrating one phase of education with another. Particularly is this important, because each division of education holds the same objective—development of the whole individual.

At a convention of English teachers, one hears the specialist in grammar saying that the child who really learns his intransitive verbs will be developed in his whole personality. You say the same thing for the student who learns to play. To think of education as a patch quilt in which each particular division holds the same objective, and yet does not relate its procedure, is to think of waste of effort.

To me, as an outsider, you have already achieved many efficiencies in developing the whole personality of the child, and I wish first of all that you would be better salesmen and show what you are doing, not only to the lay public, but to other educators.

I had my undergraduate training in music, my postgraduate training in English, a rather adventuresome career as an interviewer, and I now work in religious education. Whatever I have learned of physical education has been learned because I turned myself into a corkscrew and bored into your subject, myself.

On all sides we hear physical education and health related. Whether this is advisable or not is outside my question. One thing, however, is obvious in the ranks of health and physical education. There is division. If not why would there be so many family physicians excusing—with "phoney" excuses—boys and girls from required physical education? Not long ago I visited a high school from which fifty per cent of the girls were excused from required physical education by their family physicians. If you cannot convince the medical profession that you have something to give to the health program, then why hold yourself up as educators?

One person that I know found a clever way of dealing with illegitimately excused students. Instead of requiring students to take three hours of activity—she required them to take five hours of rest. You would be surprised to know how bad hearts improved by the next quarter.

Educators in other fields do not adequately understand physical education—either from the philosophical point of view, or from their own experiences as participants. If you do not believe that, stand some sum-

mer day in the long registration line of teachers waiting to register at Teachers College. There will be 10,000 teachers around you from all parts of the country, from all fields of education. You can see for yourself how many of them show the traces of robust, physical activity. Last summer, I heard one physical educationist say, with a superior glance at her neighbor, "I certainly would like to see that old girl run and perspire."

If physical education is to be integrated into the lives of students, into the whole curricula of the school, it must be integrated into the lives of educators. Can't you see to it that in all teacher training, more physical education is required? The English teacher knows that she cannot develop in the student body the natural, proper, and good usage of English unless the entire faculty assists her through their own personal habits. Obviously the same thing is true in physical education.

A ridiculous story illustrates my point. Two members of the physical education staff were driving over land one night with a social scientist who received her Master of Arts degree from the University of Chicago. Her motor responses were so poor that neither of her friends would give her a chance at driving the car; they settled her in the back seat and gave her the extra coat to keep her warm. All along she slept as best she could, never at any moment relieving the other two. Two weeks afterward they asked her to join them in a trip to the mountains, to which she replied, "Oh, my, no! I have not as yet recovered from our last trip! You must remember that you two are physical, I am academic."

Another example of a misunderstanding of physical education is brought out in the general organization of the curriculum. The social sciences are classed together; the natural sciences are classed together; those subjects which give meaning and value to life are grouped under the general heading of "humanities" and fine arts; dancing is classed as a skill along with typewriting. Why do you permit such an ignoring of the true nature of dancing? If dancing is a skill—then playing the violin is a skill instead of an art. Dancing is a language—the language of dancers—and has the same relation to self-expression of the student, as the language of syllables, and the language of color. Are you jealous of the art of dancing, that you should keep it in exactly the same category as the lifting of weights? If you are interested in the full integration of your profession then you should insist that dancing be given its proper place.

We are only a few generations removed from our sturdy Puritan ancestors. It is possible that the lay mind is not aware of the spiritual joy of self-expression through physical activity. There is similar self-expression and personal satisfaction for the student who does a successful forward roll over six as for the student who plays without error a Hungarian rhapsody. When this is made clear through physical education integrated into the entire educational program, then your associates will understand that physical education is more than a study of perspiration, muscle tone and intestinal peristalsis.

One reason why I think there is so much in physical education which needs to be integrated with the whole curriculum is because your activities are directly the experience of your students. Obviously the information which the student is taught has little effect upon him in comparison with what he actually experiences. Your work is almost entirely the work of giving the child direct experiences. Compare the character education possible in your field with the character education which we can give in the class room. How much more opportunity you have to teach cooperation, leadership, self control, the physical and social qualities—than does the person who tries to teach those same qualities by a "peppy" exhortation given once a week in a Sunday school room.

Is it too much to ask that you, with objectives formulated for character education through physical activity, should confide those objectives to your associates in other fields of education? The teacher of history, the sponsor of the school paper, the leader of the glee club, the director of the school dramatics, the teacher of mathematics is certain to agree with you. All of you may, then, integrate those objectives through the entire school program. Character education succeeds only when the ethical value in each separate activity is generalized, intellectualized, and constantly repeated.

In many of the students' activities, you question the transfer of training. Why shouldn't you? Might not part of that question be answered if you discuss less the transfer and more the emphasizing of your objectives in other phases of education?

Where is physical education needed in an integrated curriculum? First of all, it is needed in the whole realm of recreation. On an English staff, one expects to find some person who is prepared to sponsor the school publications; in the speech department, to find some one prepared to coach debating; certainly on the music staff one expects to find some one prepared to direct the orchestra. Why, then, shouldn't one find on the physical education staff, the recreation chairman for the school? You teach handball, football; you encourage play. Why, then, can't you teach students more to do in their social activities? There is one great throng of students who think that dancing, dancing, dancing, and an occasional game of cards are the *summa bona* of social activities. There is another restricted throng, with a degree of self consciousness, who have their social activities confined to the geography games at the Sunday school party. Such a condition is no symptom of an integrated recreational program.

The second place where physical education is needed is in the solution to the question of leisure time. Is it too much to ask that there should be in each school a group of persons interested in the leisure time activity of the students? Some students will select as their leisure activity, reading; others, music; sports; handcraft. Should not a person skilled in one of these help students of like choice to develop their interest? That will help physical activity to its proper place as a leisure time activity. We certainly need a freer choice of ac-

(Continued on page 54)

The Objectives of Physical Education

Are School Principals Satisfied?

By J. B. EDMONSON

Dean, School of Education, University of Michigan

IN preparing this paper* I asked several teachers of physical education about available studies of the opinions of school principals regarding the present objectives in physical education. I assumed that numerous studies of these opinions were already in print. From all sources I received discouraging replies. In a letter to me Professor E. D. Mitchell of the University of Michigan said:

"Offhand I do not know of any similar studies that have been attempted so I rather think that you will have to do all the exploring yourself. The topic is most pertinent and I am very sure that the weighing of our objectives by school administrators will give us a clearer insight into the future course of our profession."

In view of the limited amount of evidence that is available on my topic I am not optimistic regarding the value of my contribution in this paper. However, I hope it will encourage leaders in physical education to canvass the opinions of school principals.

Even though studies relating to my specific topic are not available, it is gratifying to find that leaders in physical education are actively concerned with defining aims and objectives for the program of physical education. This encouraging sign indicates that these leaders recognize the need for organizing physical education in terms of a valid set of objectives framed in terms of the accepted philosophy of our American system of education. An examination of the statements of these objectives, however, reveals that in them exists the same vagueness and indefiniteness that characterizes similar sets of objectives in other fields of work. It is further evident that there is some lack of agreement as to objectives. Some prefer to define the objectives in such a way as to place most emphasis on training for the worthy use of leisure, while others apparently desire to place the major emphasis on instruction that will familiarize boys and girls with the biological rules of healthful living. Some writers urge that instruction in hygiene should be the major objective, while others would place emphasis on the acquisition of skill and the cultivation of interest in recreational activities.

In view of this lack of agreement on objectives, it is not surprising that high school principals should find it difficult to answer the question, "What are the present objectives of physical education?" This question is one that I submitted to a considerable number of high school principals and high school inspectors at the recent annual meeting of the North Central Association of Colleges and Secondary Schools. In all cases I received replies which indicated a strong belief that there is marked disagreement among leaders in the fields of physical and health education and athletics. In view of this fact, I should like to express hearty approval of the efforts of your Association toward developing a more definite and tangible set of objectives and toward securing some unanimity of opinion as to their validity.

In spite of the apparent lack of agreement regarding the primary objectives of physical education, I have secured some evidence that high school principals are well pleased with the programs that have been defined for their schools, and I am assuming that these programs are an expression of certain of the commonly accepted objectives of physical education. A part of this evidence comes from a questionnaire study sponsored by the Michigan Schoolmasters' Club. The questionnaire was prepared by the Executive Committee of the Schoolmasters' Club with the assistance of Dr. George E. Carrothers, Director of the University Division of High School Inspection. Items were concerned with the amount of work now offered in certain fields, the amount of work principals would like to offer, and other questions designed to reveal the extent to which high school principals are satisfied with the present offerings in secondary school subjects. The results of this questionnaire will be discussed at the annual session of the Michigan Schoolmasters' Club.

The replies from eighty-three principals of large Michigan high schools indicate that their schools now offer 422 semesters of physical education. These principals would like to offer a total of 499 semesters, an increase of approximately 18 per cent. I submit this finding as evidence that these principals are well pleased with their present programs of physical education. Again, the returns from these principals indicate that some work in physical education is required of all pupils in the eighty-three high schools. The total number of semesters of work required is 344, an average of 4.1 per high school. The principals of these schools state that they would like to require 398 semesters, an average of 4.79 semesters. This change would represent an increase of approximately 16 per cent in the amount of work required in physical education. This finding also indicates that principals are well pleased with the physical education programs now offered in their schools.

The principals of these eighty-three schools alsc

* An address delivered at the Convention of the American Physical Education Association, Detroit, Michigan, April, 1931.

answered the question, "If you have any objections to physical education, are they to the subject-matter as now organized or are they to the present methods of instruction?" The replies indicate that ten of the eighty-three principals were not fully satisfied with the subject-matter, and that eleven of the eighty-three principals were not fully satisfied with the present methods of instruction. This amount of dissatisfaction is no greater than would be found in any one of the school subjects, even the older ones, and I feel that these returns may be interpreted as indicative of a commendable degree of satisfaction with the present school program in physical education.

As further evidence bearing on the topic of this paper I should like to bring to your attention some significant findings in a study[1] conducted by Principal E. E. Morley of Cleveland Heights (Ohio) High School and presented at the recent annual meeting of the North Central Association of Colleges and Secondary Schools. These findings relate to the opinions of the principals of high schools in the North Central territory regarding certain objectives of secondary education to which athletics might contribute. These principals were asked to indicate their opinions as to whether or not certain proposed objectives for athletics were "worthy" or "impractical." No other choices of opinion were provided in the questionnaire. In the matter of health as an objective to which athletics might contribute, 1573 principals thought it was a worthy objective, while 126 reported that it was an impractical objective. As for leisure time as an objective, 1471 principals said it was a worthy objective, while 153 said it was impractical. As for citizenship, 1540 thought it was a worthy objective, while only 80 reported that it was impractical. As for character, 1550 said that it was a worthy objective, and only 79 thought it was impractical. From this study of opinions it is clear that an overwhelming majority of approximately 1600 principals of large high schools in the North Central territory recognized health, leisure time, citizenship, and character as worthy and attainable objectives of the program in athletics as organized in secondary schools. Since these four objectives are among those most commonly emphasized in the statements of objectives by leaders in the field of physical education, one would be justified in using these findings to support the position that principals are well satisfied with the present objectives of physical education.

The North Central Association for the past few years has been concerned with the problem of standards in the administration of programs of physical education and athletics. This activity on the part of the Association has been prompted by a desire to improve conditions, particularly in the field of athletics. During the past year the Association adopted certain recommendations[2] touching the problem of athletics. Some of these recommendations follow:

"1. The program of interscholastic athletics in high schools should be so organized and administered as to contribute to the health, leisure time, citizenship and character objectives of secondary education. The aim should be to develop sufficient skill in one or more sports among all its pupils and to provide an enjoyable form of recreation in later life."

It should be noted that this recommendation gives strong support to the objectives that are so commonly urged by leaders in physical education. Its adoption may be interpreted as meaning that the leading high school principals are in full agreement with the proposals of leaders in physical education.

"2. All athletic competition should grow out of and form an integral part of the physical education program of the high school."

I am sure all of you will be pleased to learn that the Association has gone on record as favoring the organization of the program of physical education in such a way as to include the activities in the field of interscholastic athletics. This is in harmony with the view of many of the leaders in physical education.

"3. The administration of all athletic contests in the high school program should be entirely controlled by properly constituted school officials."

You are in full sympathy with this proposal, I am certain. The recommendation is intended to prevent the development of any type of "outside" control of the physical education program of a school. The recommendation constitutes a recognition of the desirability of having all of the activities of a school that contribute to the training of the pupils organized and directed by the properly constituted educational officials.

The next proposal relates to the outcomes that should be sought in a program of physical education in which athletic competition is a part. The proposal is:

"4. Fair play, courtesy, generosity, self-control and friendly feelings for the opposing school should not be sacrificed in the desire to win."

This proposal places a very definite responsibility on instructors in physical education for using the work in athletics to contribute to the training of pupils in qualities of good sportsmanship.

The fifth recommendation relates to a problem that has ceased to exist in the better schools of some of the states of the North Central territory, but which, I understand, is a perplexing problem in some of the smaller schools. The statement is:

"5. The Association recommends that girls do not participate in any form of interscholastic basketball games or tournaments."

It is my opinion that this recommendation will have a pronounced effect on the attitude of all high schools toward interscholastic athletic contests for girls.

The North Central Association has also adopted a standard relating to the participation of teams in national and inter-sectional contests. This standard was adopted as the result of a referendum vote of the high school principals in which approximately three-fourths of the high school principals declared against participation in national tournaments. It may interest you,

[1] Unpublished report of the Committee on Athletics, of the Commission on Secondary Schools, of the North Central Association of Colleges and Secondary Schools. (Will appear in "North Central Association Quarterly" for June, 1931.)

[2] Unpublished reports of the North Central Association of Colleges and Secondary Schools. (Will be printed in the "North Central Association Quarterly" for June, 1931.)

furthermore, to know that there was a very considerable amount of support for the proposal that athletic tournaments leading to state championships should be abolished in all sports. The question of athletic meets has been a much discussed topic among secondary school principals, and proposals to restrict these meets has met with some strong opposition. Not long ago I received a letter expressing protest against the action of the North Central Association in passing legislation to restrict or abolish national and inter-sectional athletic tournaments. A part of this letter consisted of the following:

"As a former captain of a basketball team from the East, I herewith ask you to do everything in your power to help the boys re-establish their Basketball Tournaments which mean more than all lessons taught through their high school days. . .

"Oh, Mr. Edmonson, why do they want to take these meets away from the youngsters—when it means so much to them? It means more to them than all the money in the world. They say they lose so much time from school, but that it all bosh. . .

"Hoping, Mr. Edmonson, that Basketball Tournaments will be held as before, that the game be given back to the kids and taken from these reformers—that prefer to make a prison out of the high schools of today. . ."

The foregoing excerpts are sufficient to indicate that the writer of the letter believes that participation in a national athletic tournament possesses high educational value. The majority of principals appear to be in disagreement with such an opinion.

I am glad that the North Central Association has taken action to assist principals in their efforts to enforce certain policies in matters pertaining to physical education and athletics. The influence of the policies of the Association, regarding these matters, is certain to be constructive.

It is encouraging to find some of your leaders advising that more attention be given to certain problems that will tend to make school principals even better satisfied with programs in physical education. In a recent article by Professor Elizabeth Halsey there appeared a series of questions suggesting that your leaders are not likely to be lulled into inactivity by the apparent success of the present programs in physical education. In this article,[3] Miss Halsey says:

"We claim a large share of the school's program and budget. How sound is the basis of that claim? Do we have undisputed facts and scientific evidence to show that we are effective in improving the health, the character, the group consciousness and social adaptability of our pupils? Or do we fall back on common sense lines of argument, and authoritative pronouncements from medicine, psychology, psychiatry, physiology, education and public health? Why are we unable to make our own authoritative pronouncements?"

Other writers in your professional journals appear to be equally critical of your objectives, standards, and outcomes. I always feel a greater confidence in a group that is critical of its own procedures than I do in one that is boastful of its success and given to an aggressive defense of existing practices.

In a recent book by Buchholz there appears an interesting indictment of the attitude of some educational groups toward criticism. In his opening chapter[4] Buchholz says:

"A strange phenomenon of contemporary education is the seeming aversion of most pedagogues to criticism of their craft and its practitioners. . . .

"This attitude might easily be misinterpreted as the outcome of a fine sense of guild loyalty, calling for admiration despite its illogic. But honestly, it springs from no such virtuous source. The pedagogue of quality dislikes having his weaker brethren and their projects openly censured, primarily because he fears that if education of any type is discredited before the layman, then all educators, including himself, may find it difficult to hold public confidence. . . .

"This state of affairs is lamentable. It accounts for such conditions as are gently condemned in the pages that follow; erects serious obstacles in the path of real educational progress; and tends to misguide laymen who should be thoroughly enlightened concerning public education. If representative educators were willing to be aggressively critical always, they would not necessarily thereby hazard the public's good will—their willingness itself would be sufficient to correct many of the ills that these educators now dread having revealed to the people."

I fully agree with Buchholz in his contention that many members of the teaching profession are disinclined to take a critical attitude towards problems in education. It seems to me that it is especially important for leaders in the field of physical education to be critical of objectives, standards and programs. Your field is a relatively new one. The development of work in the field of physical education has been rapid, especially during the past ten years. In view of the prominent place physical education has attained, it is quite certain that educators will become increasingly critical of the time and money expended to support the program.

In the inquiries relating to physical education, may I urge the importance of attention to studies of the opinions of school principals on the objectives and outcomes of instruction in physical education. It is well to remember that the opinions of specialists are invaluable in the framing of plans and policies. It is equally important, however, to remember that the opinions of generalists, such as school executives, are also of real significance and that such opinions may help prevent serious deficiencies in a program built by specialists.

In conclusion I wish to summarize my answer to the question, "Are school principals satisfied with the present objectives in physical education?" The available evidence indicates an affirmative reply. In the first place, the returns from the principals of eighty-three of the larger secondary schools in Michigan support the position that principals are well pleased with the present program of physical education. In the second place, the evidence reported by the Committee on Secondary School Athletics as given at the recent meeting of the North Central Association of Colleges and Secondary Schools indicates that principals are well satisfied with the present objectives as defined by your leaders for school athletics. In the third place, the North Central Association's pronouncements on athletics, as expressed in the recommendations mentioned above, are in full accord with objectives and policies recommended by writers and leaders in the field of physical education.

[3] Halsey, Elizabeth, "Current Educational Problems in Relation to Physical Education," The Journal of Health and Physical Education, (Vol. II, No. 2), Feb., 1931, pp. 12-13.

[4] Buchholz, H. E., Fads and Fancies in Present-Day Education, pp. 1, 2.

What Gymnastic Aims Should Be

By AGNETE BERTRAM

Gymnastikloerer ved Universitetet Kobenhavn

IN the schools, the aim is education. Education of what, you ask? The ordinary reply is that we want to equip children for their future status as grown-up persons. To educate them for the future we attempt to give them knowledge of: first, how the world looks (geography); second, of how the world was created (astronomy, geology, religion); third, of what it is thought to be made of and of its laws for existence (chemistry, physics). Next we teach them a knowledge of things that concern human beings such as: first, how they look (zoology, botany, anatomy); second, how they were created (biology, religion); third, the laws for their existence (physiology, history). Lastly they must learn of what concerns human beings only —those subjects that train different skills such as languages, mathematics, music, drawing, gymnastics, and sports. That is to say that children should receive training in all the different subjects that embody an understanding of what life is and of how to live it. Let us then define education as the training to acquire the best equipment for life so that the result may be the best equipped man or woman.

With this understanding, therefore, the subjects should not be divided in the medieval clerical manner into spiritual and material so that gymnastics are considered of the body alone and inferior in importance. Let us be modern—or classical if you like—in our claim that man should be educated as a *whole*. And the teachers of gymnastics should lead as representatives of this claim. Their training must be the best obtainable, the most all-around. The term "physical education" is misleading in the sense that this subject involves something psychical as well. The fact is that all gymnastic text books list among the special aims of gymnastic exercises some aims of a spiritual nature, such as courage, self-respect, self-restraint, and discipline.

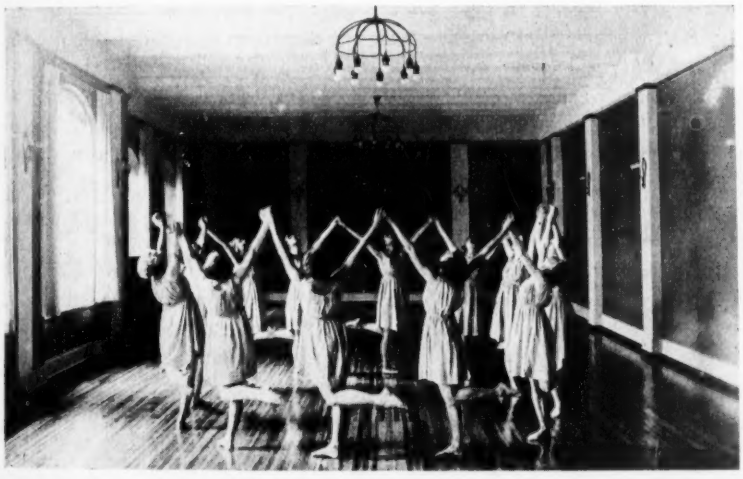
I should like you to look upon man as a system, as an organism, where everything can exist only in relation to other parts as a complicated but intimately combined whole. From this point of view, gymnastics must be the basis of all education. Why? To explain this statement we must examine the beginnings of organic life.

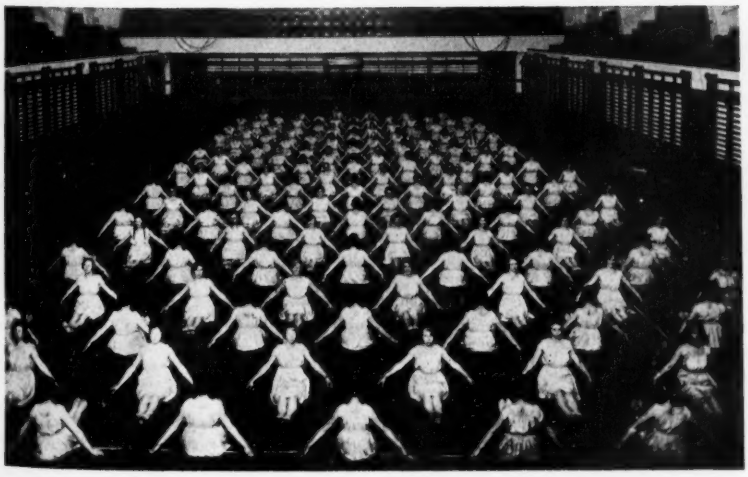
The working element in the development of an organism from a one-cellular to a multi-cellular organism is movement. The cause of the development of man to an organism of more and more differentiated organs and adherent faculties is movement. As movement is the primary quality of an organism, we may say that movements will develop man as a whole, and that gymnastics in this sense is the deepest rooted form of education. Place a race in the water and the movements will create the swimming faculty. The *purpose* is to sustain life, the *remedy* is movement, and so the *faculties* develop. This process takes place in man. In primitive man, the hunting of food created a quick, stable, noiseless walk, together with quickness and keenness of eye and a firm arm; a complex of faculties in cooperation, in harmony. If the brother of this imaginary primitive man took up the gymnastic principle of training by heel-

raising, deep-knee-bending three times, arm-bending and stretching six times, etc., twice a week, he would still not be able to compete with his brother in aptness for life. Why? The difference lies in the fact that the first man has a purpose for his movements which unconsciously dictates them. The man as a whole is one with his actions. The second man is moving not from an all absorbing purpose but because of an act of mind: he is *consciously* exercising. The unconscious movements of the first man fit him for life.

If I am not mistaken, you Americans do not consider gymnastics as highly as you do sports and games, and in one respect I congratulate you on this feeling. I conclude from this fact that you do recognize the high educative value of sports. If I may use this in connection with the thread of thought previously given, I would like to remark that I think this value is an outcome of the interest games awaken as purposive movements, that is, as movements that are an adequate answer to a given situation. If I throw a ball to you, I will try to make a movement adequate to the distance between us, to the weight of the ball, to the idea I have of your time of reaction and faculty for grasping the ball. According to my ideas in these matters, I will throw it faster or slower, and all this will be done unconsciously. It is because the movements are purposive in this meaning of the word, just as the movements of the hunting savage were, that sports are pleasing and awaken interest in their goal. Though this is play, it is more than that; it is a reproduction of the doings of the primitive man in earnest living. It is developmental because it concerns the *total function* of the faculties. A failure here arouses more attention to coming situations.

This way of moving will make the different parts of the body, the different groups of muscles, and the different organs behave in relation to each other in the *right proportion*. But if there should be only the slightest pause for meditation, the answers will be inadequate. The Hamlet type is not a good sportsman type; instead of acting immediately to attain the goal, he meditates whether he will succeed or not and, consequently, he will not succeed. "Thus conscience does make cowards of us all and thus the native hue of resolution is sicklied o'er with the pale cast of thought."





As we are aware of the good results of fitness in natural movements, our next question must be, "Why then don't we indulge only in sports?"

Sports, however, have nowadays so many branches and many of them are very one-sided in their effects. When this is so, they are not all-around efficient and are not a perfect means for normal education. You may reply to this criticism that if we complement one one-sided game with other one-sided games the result will be all right. This is not proven, however. You are using as much nervous energy to train in a one-sided sport as you should to develop the whole person, so that you

(Continued on page 50)

Organic Development Through Exercise

By
LAURENCE T. ROGERS
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SINCE the time of the epoch-making discoveries of Jenner, Lister, Pasteur and Koch, medical men have been more and more concerned with the prevention of disease. However, even up to the present time, the interest of the physician has of necessity been largely concerned with the diagnosis and treatment of pathological conditions rather than with the prevention of such conditions. It is with no sense of disparagement of the noble work of this profession, then, that I quote the time worn adage, "An ounce of prevention is worth a pound of cure." On the contrary, it is amazing what great advances preventive medicine has made in recent years, in view of the fact that the doctor receives his fee, not for the prevention of disease, but for its treatment. I should like rather briefly to summarize for you some experimental findings which seem to indicate the value of activity, exercise or movement, as a possible agency for the prevention of disease and as an even more essential agency in organic growth and development and the maintenance of a state of robust, vigorous health in the normal individual.

Many of you are familiar, no doubt, with the statistical study of Dr. Dublin upon the longevity of college athletes. You will remember that this study showed the athlete to have a slightly better chance of long life than the average insured man only *after* he had safely passed the age of forty-five. Before he reached the age of forty-five, the varsity athlete in the institutions studied was shown to be a greater risk than the average insured man of the same age. These results were very disappointing to those who had the preconceived idea that the college athlete, representing the cream of the nation's manhood, as it were, would have an expectancy of life significantly longer than that of the average man. Not only was the mortality rate of the athletic group larger than that of the average insured group, before the age of forty-five, but after the age of forty-five, the athlete was more liable than the non-athlete, to some form of heart disease. Dr. Dublin states that this evidence is neither exhaustive nor conclusive; but it does prevent us from a vociferous advocacy of the highly competitive intercollegiate athletic program of the past and present as a means of insuring healthy and happy old age.

However, because there may be such a thing as *excessive activity,* we need not at once condemn all activity as harmful, any more than we would condemn all eating because certain persons have been known to suffer from acute indigestion through over indulging in Thanksgiving dinners. Quite the contrary,—we should rather investigate the subject of exercise and its effects upon the body as exhaustively and thoroughly as physiologists and nutrition experts have, in the past two decades, studied foods and digestion in order to determine the proper kinds and amounts for the various age levels among human beings. To some extent, this study of the physiological effects of exercise has been carried on, yet we are far from knowing as much about the effects of exercise as we know of the essential elements in a balanced diet and of the chemistry of foods and of the digestive process in general. Yet we do know some of the specific results of a certain amount of activity continued more or less regularly through a period of weeks.

We know for instance, that training in a certain activity, be it piano playing or wrestling, enables the performer after rest to engage in that same activity with successively greater efficiency and less fatigue until the so-called physiological limit, in that activity, is approximated or reached. We know also that the resistance to fatigue is more or less specific to the set of muscles which are trained. This fact was strikingly illustrated in an experiment conducted under the direction of Dr. Howe of the Department of Physical Education and Hygiene of Wellesley College upon the well known marathon runner, Clarence DeMar, seven time winner of the Boston Marathon Run. This remarkable athlete, although about forty years of age, had for many years made it a practice to run ten or more miles daily. His resistance to fatigue — when running — was phenomenal in comparison with that of an untrained man. However, when this runner submitted for a certain time to the test of stepping up on a chair and stepping down again, he showed characteristic signs of fatigue as quickly and to about the same degree comparatively as those of a college sophomore girl, also untrained in that activity. This experiment tends to support the idea that resistance to fatigue is largely a matter of specific and localized phenomenon. It is further known that almost any set or group of voluntary muscles may be trained to greater and greater resistance to fatigue. Too little is known of the complex chemistry of muscular contraction, or indeed of actual muscle substance, to permit of more than a few observations upon the specific physiological changes induced through graduated exercise of a muscle which, after exercise, is permitted fully to restore itself through rest.

It is supposed that glycogen is the most common source of the energy for muscular contraction. This glycogen occurs in the rested muscle in amounts varying from 0.5 to 0.9% of the weight of the muscle, and considering the fact that about 75% of the muscle by weight is water, we can readily see that glycogen makes up a considerable portion of the solid substance of muscle—from 2% to 3.6% in fact. The exact chemistry

of muscular contraction is somewhat obscure, but according to Howell, when energy is needed, the glycogen is synthesized into hexose monophosphate, which breaks down upon suitable stimulation into lactic acid and phosphoric acid (phosphate). "This reaction," states Howell, "is supposed to take place in the contracting muscle and to constitute, in fact, the essential chemical change of contraction." Since this reaction is reversible, the muscle, depending upon its condition, is able to resynthesize the hexose phosphate from the lactic acid, glycogen and inorganic phosphates. It is generally accepted that hexose phosphate is only an intermediate stage in the metabolism of glycogen to lactic acid.

The significance of exercise upon the chemical reaction accompanying muscle contraction seems to lie in the fact that a trained muscle can perform its work with less waste than an untrained muscle. It has, in the first place, a greater capacity for the storage of glycogen. Even more important, it is able much better to resynthesize the lactic acid into the precursor substances. An untrained muscle loses a large part of the lactic acid into the general circulation where its chances of reconversion and conservation are less; whereas the trained muscle conserves the lactic acid and instead of being a harmful waste product, it is actually a useful substance.

Other changes in the trained over the untrained muscle seem to be an increase in size due to an actual increase in the number of the fibrillae which compose the muscle fiber. Jordon, the histologist says, "Muscle growth with exercise depends upon the enlargement of the muscle fiber consequent upon a multiplication of fibrillae by a process of longitudinal splitting and their individual enlargement."

Another change which has been noted, particularly for the cardiac muscle, of trained animals over untrained, is an increase in the pigment content. This pigment is similar to (though perhaps not identical with) the haemoglobin of the blood. We may term this substance "muscle haemoglobin," and an increase in this pigment is supposed to aid in the respiratory interchange of the muscle cell, in increasing its oxygen securing capacity and the functional efficiency of the cell. While I know of no evidence which is authoritative in proving that exercise increases the pigment of ordinary striated muscle, it is a logical supposition in view of the ability of the trained muscle to resist fatigue. This muscle haemoglobin is known positively to exist in the red muscles along with another related pigment, cytochrome, (myohematin) which Keilin has demonstrated.

So much for specific changes within the muscle. These changes are only a small part of the general systemic changes which accompany activity and exercise. We shall have only time to briefly mention these other changes which result from activity. Among these, of first importance are the changes in the blood and body fluids.

Schneider has reviewed, quite fully, the subject of blood changes resulting from exercise. He reports that Full and Herxheimer have shown quite conclusively that training increases the alkaline reserve of the body. You will at once realize the importance of this fact to modern medicine, for one of the most current views regarding the common cold is its usual accompaniment of acidosis. An impoverished alkaline reserve may be an important item in the susceptibility to colds. It should be noted by way of caution, however, that excessive activity in one untrained may lead to a diminution of the buffer substances of the blood and muscle and a resulting acidosis with accompanying susceptibility to the virus of the common cold.

Training not only materially increases the buffer action of the blood and tissues but also increases the red blood corpuscle content. This increase may be immediate and temporary in the case of moderate exercise, due to the contraction of the spleen with a consequent forcing of its blood corpuscular content into the circulation. However, Schneider and Harcus have reported permanent increases in the haemoglobin content of the blood during training, which they suggest is accompanied by a corresponding increase in the number of red blood corpuscles.

Exercise seems, in animals at least, as reported by Broun, to be the pace-maker for the bone marrow in producing new red blood cells. Klubs reports distinctly more marrow in the bones of exercised dogs than in the bones of dogs from the same litter which had been kept inactive in cages. Schneider, who reports the above-cited experiments, concludes that, "such data furnish testimony that frequent and regular physical exercise is important for the maintenance of an adequate supply of blood corpuscles" (and of course it is a well known fact the buffer action of the blood increases with an increase of blood cells.)

Before closing this paper with a few conclusions and generalizations, I should like to mention the experiment of Howe and Merrill upon exercise, fatigue and resistance to infection:

> In controlled experiments upon rats, they found that rats which had been trained through long periods of vigorous exercise were more resistant to infection with the pus forming bacillus (Prendomonas aeruginosa) than untrained rats. They further demonstrated that resistance to infection was considerably diminished by fatigue, but that the trained rats showed a much smaller mortality when infected in the fatigued state, than the untrained rats when so infected.

I have tried in this article to suggest a few of the ways in which exercise may produce beneficial effects in the blood and muscle. The suggestion has been made that exercise may be a valuable agency for the prevention of disease through the heightening of resistance, if taken regularly and in moderation. It may, in other words, be a realm of preventive medicine of which we are still largely ignorant. And, even if, after careful investigation, we should find that properly regulated muscular activity is not a very effective means of combating infections, we must still admit that the quality of living, termed HEALTH, is improved through exercise; and after all it is in this condition of positive, glowing health, that we are interested.

There is not time to elaborate upon the idea that ex-

(Concluded on page 59)

Simplified Canoeing Instruction

By DR. FRANK LYNAM

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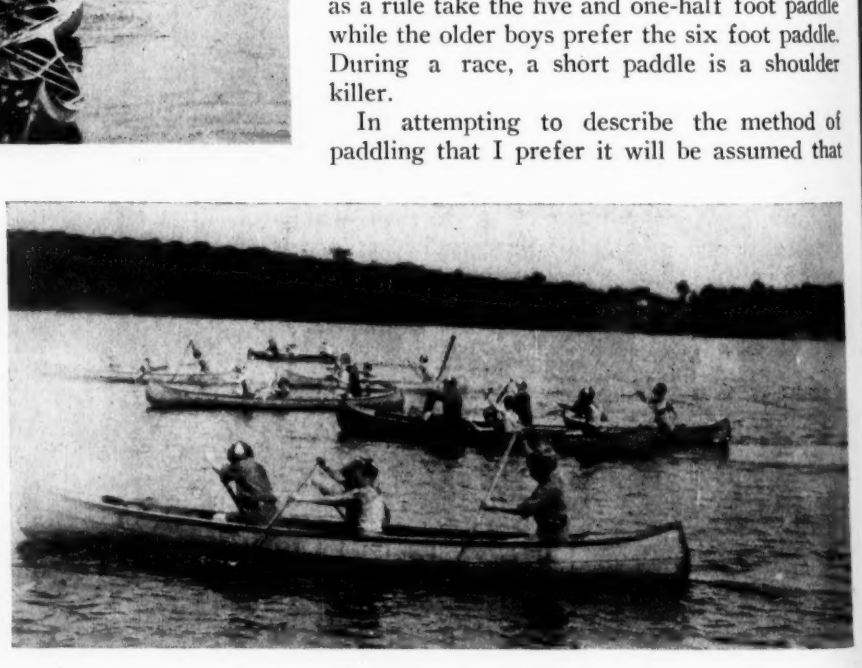
Camp Chicopi, Ontario, Canada

OUT of the experience of teaching paddling to youngsters for several years I have evolved a method that is comparatively simple and has saved me considerable time. The paddling that one ordinarily sees on rivers and lakes near towns should not be dignified with the title of paddling. This performance consists of what the Indians call the lame duck stroke, that is, two or three strokes or dabs are given on one side of the canoe and then, as it begins to turn, the hand on the end of the paddle is turned in, the thumb for instance, rotating toward the stern of the canoe until the water catches on the outside of the blade when it is given a yank and the canoe straightens up. This has the effect of backing water and checks the speed of the canoe; and against a strong wind or up a fairly fast current, the canoe soon ceases to advance. Then, too, the yank on the paddle comes on the end of the fingers and they soon tire.

There is nothing new about the way I paddle; it was learned from the Passamaquoddy, Casco and Kennebec Indians at Bar Harbor when I was a very young boy and these Indians used to come there summers to sell baskets and teach paddling. I have since seen the Algonquin, the Chippewa, the Ojibway, the Sioux, and in the movies the Philippino and South Sea Islander; and all paddled with the same turn of the wrist. The method described in the Encyclopedia Britannica is in accordance with the way that all these Indians paddle. One of the difficulties of teaching paddling is that a little wind will blow the canoe in the wrong direction. I have a buoy anchored and put this in the canoe of the pupil. It allows a fair range of distance and holds the canoe to the wind.



Above—A side trip provides plenty of canoeing experience

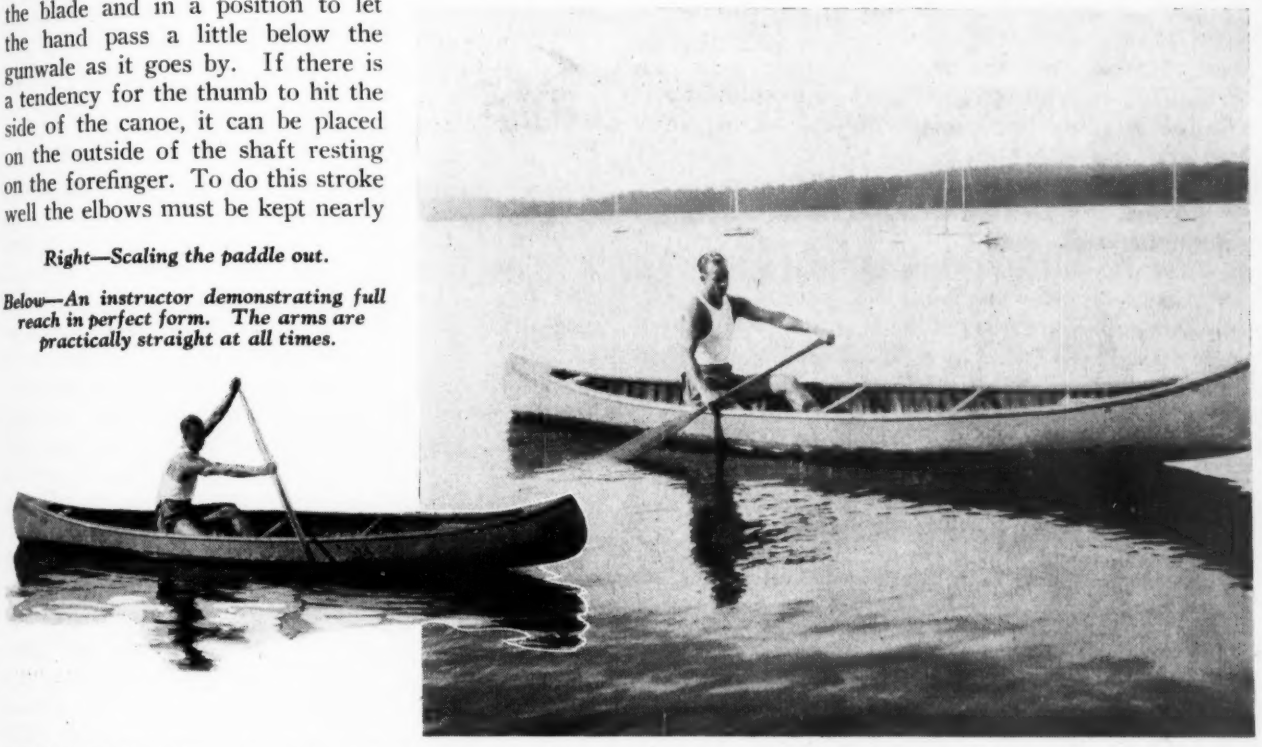
Right—The finish of an enthusiastic race

In the first place seat the person you are teaching, provided he is in a canoe by himself, on the thwart of the canoe—that is about a third of the way up the canoe—and not on the stern thwart. The stern thwart is the most unstable place in the canoe, and unless you have weight in the bottom of the canoe, you are sitting in that part of it that has no bearings, and the bow is well up in the air. Last season a professional swimmer wanted to take her friend out paddling and assured me that she had been brought up to canoes. As there was quite a breeze blowing, I suggested that they change their clothes because water might slop into the canoe. The passenger concluded to take my advice, and while she was gone the swimmer thought that she would go out and brush up a little on her paddling. She sat down in the stern thwart and pushed out from the dock, the canoe took one or two little lurches, and a perfectly good looking dress was ruined.

The length of the paddle should be about the span of the arms; some say about your height but I think that is apt to give too short a paddle in many cases. I find that boys under fourteen as a rule take the five and one-half foot paddle while the older boys prefer the six foot paddle. During a race, a short paddle is a shoulder killer.

In attempting to describe the method of paddling that I prefer it will be assumed that

the individual is paddling on the left side of the canoe with the right hand on the end of the paddle. The right hand is placed on the end of the paddle with the right wrist slightly bent so that the palm of the hand rests in the curved flat of the handle made for this purpose. The fingers are held rather relaxed and you should be just able to see the wooden corner of the paddle between your thumb and forefinger. The other, the left hand, should hold the shaft of the paddle just above the blade and in a position to let the hand pass a little below the gunwale as it goes by. If there is a tendency for the thumb to hit the side of the canoe, it can be placed on the outside of the shaft resting on the forefinger. To do this stroke well the elbows must be kept nearly straight all the time—in racing absolutely straight all the time. To begin the stroke let the paddle swing forward as nearly perpendicular with the side of the canoe as you can. When it has swung a little forward of the perpendicular on the reach, let it fall into the water by its own weight and that of your arms and this will just about allow the blade to be covered. Don't plunge it in unless racing and you are spurting.



Right—Scaling the paddle out.

Below—An instructor demonstrating full reach in perfect form. The arms are practically straight at all times.

Now: *don't pull* on the paddle; it has been dropped in in front of the perpendicular and will take on an ample load of water. Just let the paddle drag toward you by the weight of your arms. In racing or going against a very heavy wind, you may have to pull some but in practically all conditions where all day paddling is necessary, just let the paddle drag toward you with your arms held straight. A person must sit with the chest out and as "straight as the proverbial Indian." When the left hand on the shaft of the paddle reaches a point even with the seat that you are sitting on—and don't go beyond this point—it is stopped by a twist of the hand on the end of the paddle until the water catches the blade on the outside and presses it against the side of the canoe. This twist is done by turning the hand forward; that is the thumb should rotate toward the front, the thumb turning until it points to the bow of the canoe so that the blade is turned a little forward of the parallel line of the canoe and is pressed upon by the water. On the recovery, do not slide the paddle along the gunwale of the canoe; keep it in this one spot and use the side of the canoe for a fulcrum. Don't let anyone tell you that an Indian never touches the side of a canoe with his paddle if paddling alone or in the stern of the canoe because he does. So far we have swung the paddle forward, twisting the body slightly forwards to get a good long reach, and have dropped it into the water a little in front of the perpendicular and by its own weight and the weight of our arms have dragged it back to a point opposite the seat where we are sitting. We have turned the wrist toward the front so that the water is pushing the blade against the side of the canoe.

The next step is one which I ask the pupil to take on faith, to ask no questions and do just as I say, with the assurance that he will get the explanation in the next lesson. This is where the time saving element comes in in teaching. In this last position the hand was flat on the face of the paddle; I then ask him to press on the end of the paddle so as to push the shaft of the paddle across the canoe at right angles—almost down to the opposite gunwale. This must be done with the arm on the end of the paddle absolutely straight and the body absolutely straight. Then he must go out and repeat this stroke in this same way for twenty minutes before coming back. At first this tips the canoe badly, but he soon learns to offset this with his body weight; and usually when he comes back at the end of twenty minutes he has caught on to the next step. It is this: he has been told to turn the paddle a little forward of the parallel line of the canoe and this has pressed the blade against the side of the canoe so that he soon finds that, when he presses down on the

paddle and turns his hand back a little, the blade has a tendency to slide forward and the canoe balances easier.

So far we have touched the fundamentals of paddling. To go a little more into detail, we will take up the turn of the wrist, as the skill with which a person does this determines his efficiency with a paddle. At the end of the stroke back, when the left hand reaches the seat upon which one sits and while this arm is held firmly, a pressure is made on the end of the paddle on the palm of the hand and to the outside toward the right. At the same time the paddler quickly turns the blade a little beyond the parallel with the side of the canoe and just as quickly back but with the same lateral pressure toward the opposite gunwale; this gives a tendency of course for the blade to scale out toward the front. The quick in and out twist of the hand on the end of the paddle is generally sufficient to keep the canoe straight, as it has hardly started to swing at this time. In racing I have often taken a dozen strokes without further steering; with the paddle held to its spot on the gunwale and the right hand with a straight elbow pushing across the canoe. The canoe is forced ahead by this lateral propeller like action, the right hand travels through an arc from above the gunwale or the left in a curving direction across the canoe and back until the blade is out of the water. This leaves the right hand almost down to the right gunwale, and the paddle is swung forward with a twist of the body for the next stroke and is not carried forward lifted by the muscles of the arms which is very tiring in a paddle of any distance.

Turning blade preparatory to scaling out

To summarize: swing the paddle forward with a rotating motion at the waist line and up, let it drop easily into the water a little in front of the perpendicular with both elbows straight, let the weight of the arms drag it back to a spot opposite the seat upon which you are sitting; then turn the wrist forward, that is, with the thumb rotating toward the bow and a little beyond the straight line and then back again to a point a little outside the straight line of the canoe, exerting a lateral pressure toward the right as if the thumb had been turned a little too far and had rebounded. Keep a steady pressure—not a hard pressure—toward the right gunwale until the blade has scaled out toward the bow and is allowed to keep right on to the beginning of the next stroke. Again keep the arm on the end of the paddle straight and your body straight. When done correctly the paddle, or rather the blade, has two motions, a drawing back and scaling forward in a direct line up to the beginning of the next stroke. The lame duck stroke has three motions and two of them are exerting a backward action.

As for "Don'ts": don't turn the wrist until you have pulled your stroke clear through, keep your blade square with the water. Don't bend your arm when you press down on the end of the paddle and don't press down hard—in an all-day paddle the weight of the arms alone is sufficient. Don't fail to sit straight. Don't sit on the back seat when alone in a canoe (if you can paddle in the middle of a canoe you can paddle anywhere). Don't think that you can read directions on how to paddle and go out and paddle correctly in a few minutes; you will have to try it several times and you will have to read over the directions several times to understand them as this procedure is very difficult to explain.

Sometimes you may wish to steer a little more to the side on which you are paddling, as a little puff of wind may blow you off your course. When this occurs, sweep the blade of the paddle well under the canoe but otherwise finish your stroke in the same way. This will give you a longer leverage and thus a longer time for the blade to exert its steering action.

If a person paddles correctly, it is almost as easy to paddle standing as sitting or kneeling, even in rough water. In fact it is easier for me. There is a marked advantage in standing when running rapids as you can see submerged rocks much easier and have a better leverage on your paddle for a sudden hard stroke. Also in pushing out into a surf on the ocean or at times on the Great Lakes, you have to push off just as a comber breaks and jump in and paddle and there isn't time to kneel or sit. A person can't really handle a canoe unless he can paddle standing. It gets him better acquainted with the behavior of a canoe.

And now for a word about the winds; paddle on the side away from the wind when possible. If alone in a breeze it is almost impossible to paddle on the side towards the wind. In order to impress this fact on the pupil we arrange for him to take his test in a light breeze. For some unaccountable reason he almost invariably starts on the windward side, and often in the stern of the canoe, and the canoe goes drifting off sideways. He is given another week's practice before he tries again. I have often seen adults, who thought

(Continued on page 56)

The Hygienic Problems of Adolescence

By

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THE high school age is the most neglected one from the hygienic standpoint. I think you will agree with me when I say that the hygiene of infancy and early childhood has received extensive consideration from parents, teachers, public health officers and physicians with the result that the infant mortality rate has been materially lowered and the average life considerably prolonged. Most of the progress has been made in the age group before puberty, and the results reflect credit to all who cooperated in this praiseworthy activity. Unfortunately in too many instances the good work has not been kept up in the child beyond the age of puberty, and some ground has been lost here in that the beginnings of degenerative changes which might have been picked up and possibly corrected at this time have not been discovered until too late.

If time permitted, I believe that we could easily see that the child before and after puberty are two different beings. In fact they are so dissimilar that the careful observer has difficulty in determining in what respects they are alike. In justification of this statement we may consider several outstanding differences. In the younger children the sexes are not so strikingly different. It is rather easy for a girl to play a boy's part in a play and vice versa. Shakespeare's heroines were enacted on the Elizabethan stage by boys because public opinion considered acting by women as unladylike.

The voice after puberty in the boy changes both in pitch and in quality. Some of our finest sopranos and altos may be found in the boys' choirs, but not so after puberty. Not only are the structural differences great but the mental evolution is quite marked.

The high school child then belongs in a group distinct from childhood and from maturity. Stanley Hall, the greatest authority of all time on youth, gives us a striking outline of the leading characteristics of this period:

"Adolescence is a term now applied to a pretty well marked stage, beginning at about thirteen with girls and a year later with boys, and lasting about 10 years, to a period of complete sexual maturity. The first stage (the first two years) is marked by a great increase in the rate of growth in both height and weight. It is the period of greater susceptibility to sickness for both sexes; but this vulnerability is due to the great changes, and the death-rate is lower in the early teens than at any other age. It is the time when there is the most rapid development of the heart and of all the feelings and emotions. Fear, anger, love, pity, jealousy, emulation, ambition, and sympathy are either now born or springing into their most intense life. Now young people are interested in adults and one of their strong passions is to be treated as if they were mature. They desire to *know, do,* and *be* all that becomes a man or woman. Childhood is ending, and plans for future vocations now spring into existence, and slowly grow definite and controlling."

You will notice that President Hall describes briefly two types of change: the one physical and the other mental or emotional. Much more has been given to one type than to the other in the past. Because adolescence is the period of relatively great intellectual activity almost all of the accentuation in the past has been placed on the training of the mind of the adolescent to the almost total neglect of the training of his body. Only at the present time are we beginning to see educators awakening to the importance of the physical education of the youth. This has resulted in immeasurable suffering and failure in the training of youth in the past. That we may hope to profit by our mistakes of the past, let us consider some of them and see if we can find a remedy out of our own common sense.

The first mistake in the past is that we have given youth no sex instruction but have left him to accumulate a mass of misinformation, some of it dangerous, very little of it true and all of it gained surreptitiously, often with a sense of shame. Why such a state of affairs shou'd exist side by side with the profound common sense and intelligence which most people enjoy is one of the great mysteries of life. The solution of this problem, it seems to me, lies in the proper instruction in the high school in courses in biology which all high school students should be required to take. We must admit that most children's parents have failed in this duty. Inasmuch as the past generations have felt embarrassment and hesitation in giving such instruction, let us bend our efforts toward raising a new generation who will not feel this disinclination to instruct their children.

The next great mistake has been that we have often stifled the enthusiasm of youth without giving a fair exchange of something of a more workable nature. It must be remembered that adolescence is a period during which the highest mental and moral qualities are developing. The world blunts these qualities later on which results in a full grown man or woman who is not particularly honest, or moral, or courageous, or generous, but one who is steeped in his own affairs, self centered, avaricious and often intolerant. We have known of many young people who were forced into occupations which they did not want to follow. Fortunately, these cases are getting to be rather rare. Years ago many young men and women were forced into marriages which they did not wish. Tennyson in his "Locksley Hall" refers to this when he says:

"Cursed be the social wants that sin against the strength of youth!
"Cursed be the social lies that warp us from the living truth!
"Cursed be the sickly forms that err from honest nature's rule!
"Cursed be the gold that gilds the straitened forehead of the fool."

A parent must steer a very careful course between allowing the capriciousness of his adolescent son or daughter to bring unhappiness upon him, and at the same time direct the enthusiasm toward a happy conclusion.

Another mistake we have made is that we have not set youth a particularly good example. One hears many reports nowadays of the enormous amount of drinking in college, but I ask you to believe me when I tell you that compared with the immediate past the modern American college is a Sahara desert. I imagine that the same state of affairs exists in high school. What drinking exists is by way of imitation. Youth is a great imitator; he imitates our vices as well as our virtues, and it is no fault of his that our vices often obscure our virtues.

But the greatest mistake we have made is that we have assumed that because our boy or girl has been living and has enjoyed good health we need to give no attention to his physical condition. This mistake has been forced on my consciousness so often while I have been examining freshmen entering college that with your permission, I shall outline to you a number of evidences of inadequate health supervision of high school students.

It is not unusual to find college freshmen who show effects of too much indulgence in high school athletics. I remember very distinctly one case of a famous high school athlete who came to the University of Cincinnati and was astonished when we would not pass him for gymnasium or track because of his heart. He had had no medical supervision in high school and as a result had an enlarged and very irritable heart. We have seen many such cases and some of us have concluded that on the whole, high school athletics, without proper supervision, are a very bad thing. In order that there may be no misunderstanding, I shall define what we consider adequate supervision: (1) A coach scientifically trained in one of the accepted schools of physical education should be the one entrusted with the training of the team, and (2) a good physician, experienced in making medical examinations should frequently examine all boys and girls indulging in athletics.

By far the commonest defect which we notice in examining college freshmen is malnutrition. More than half of them are under weight according to the tables of Baldwin and Wood which are widely accepted as a good standard.[1]

This condition has been so common as to give us grave concern for the future physical welfare of the race. It is not confined to poor boys and girls; in fact it is more prevalent among the well-to-do. As near as we can judge we believe the following factors to be the causes:

1. The diet, insufficient quality and quantity of food; the dietary habits of the child; eating between meals; improper balancing of the diet.[2]
2. Rest. We believe that many cases are the result of insufficient sleep, and too much physical activity.
3. Hard work and worry. This accounts for a certain amount, at least.
4. Faulty health habits in general and lack of home control.
5. Physical defects, especially diseased tonsils and abscessed teeth.

We believe these to be the causes because we have noted improvement in a large number of cases when defects have been corrected, or habits changed.

Inasmuch as diet concerns these young people so vitally, I hope you will pardon a brief outline of what I feel should be the bulk of the diet of adolescents. Because they are growing animals they need protein. It is unfortunate that protein has been hammered by our food faddists. There isn't the slightest evidence that protein causes Bright's disease, yet I find this notion firmly entrenched in the minds of people. Because adolescents are active they need fuel. They need a lot of fuel to prevent the destruction of their body tissues. The two main sources of this fuel are fat and carbohydrates. The eating of fat is one of the great digestive problems because too much often leads to dyspepsia. In brief, we may say that the best sources of fat for human consumption are in butter fat and egg yolk. Animal fat on meat is difficult of digestion in many cases. Carbohydrates are the richest source of food energy because the boy or girl is able to eat four times as much, by weight, of carbohydrates than of fats. Fresh fruit and fresh vegetables should be taken in great abundance. Success in feeding the boy or girl consists in varying the diet to the greatest possible extent and making sure that it is well balanced. It is the opinion of most authorities that strong coffee, strong tea and alcohol are improper beverages for the growing boy or girl. Tobacco has a deleterious effect upon the appetite and should not be used by the growing child. His appetite is the child's best friend.

The remarkable craving for sweets must be gratified. Candy can and should be eaten preferably just after but *never* just before a meal.

The adolescent who is underweight[3] should be re-

[1] In a survey made of the children in South High School, Grand Rapids, Michigan, reported in a term paper at the University of Michigan, 19½% of the boys and 14% of the girls were more than 10% underweight and 25% of all students were considered by the examiners as having poor nutrition. In the class of 1932 at the University of Michigan 18.7% of the girls and 14% of the boys were more than 10% underweight when examined as freshmen.

[2] In the study made at South High School, Grand Rapids, Michigan, mentioned above, 15¼% of all students missed from one to seven breakfasts in a week, 22¼% ate their breakfasts in from one to ten minutes, 24% habitually used coffee for breakfast and an additional 11¼% drank coffee at times for breakfast, 1% ate no lunch at all, 38% did not take milk for lunch, 50¾% ate between meals, and, of this number, 39½% ate fruit, 21% candy, 14½% pastry, 11% sandwiches, 5% milk and 2⅛% ice cream. 6¼% ate no fruit in the period studied, and 40¼% did not eat any leafy vegetables on the day before they were questioned.

[3] In the study made at Grand Rapids mentioned above, 81¼% of the students retired between the hours of 9 and 11 P. M. and 93½% arose in the morning between 6 and 8 A. M. This would probably average about 9 hours sleep for most of them. However, 8% retired between 11 and 12 P. M. while 3¾% arose between 4 and 6 A. M. This same study showed that ½% of the students went to the movies every night, ½% more attended a party every evening for two weeks, ½% more attended movies ten evenings in the fourteen, and another ½% eight evenings in the fourteen. 33½% attended no movies at all.

quired to sleep at least ten hours a day. He should be compelled to rest in bed when he is ill or convalescing from illness. It is astonishing the sublime faith put in drugs to cure illness and the disregard of natural means of preventing or curing it. A typical example is this: a young man comes to see me in my office saying, "Doctor, I feel a cold coming on and I want you to give me something to break it up."

"Go to bed now," I tell him, "and stay there until tomorrow morning; sleep all the time if you can."

"Gosh, I can't do that," he replies, "I've got a heavy date tonight."

The adolescent has not the strength of a man and should not be required to do a man's job. Ideally if a man should not be required to work more than eight hours a day, a boy should not be required to work more than six. Yet it seems necessary to require boys and girls to do much more than this even to the extent of helping to support the family.

The worries of a family should not be precipitated upon the children thereof—they have worries enough of their own. There is at least one period of a human's life when he should be as free from care as possible and that period reaches to his twenty-first birthday if not farther. The worries of a boy or girl should be sought out by his parents, his teacher, his pastor or his doctor and he should be helped. We must always remember that the "thoughts of youth are long, long thoughts." "Thought" used to be synonymous with "care," and still is to a great extent.

Then, too, the physical defects of an adolescent should have the attention of the best doctor available, and that "best" doctor is usually the family physician or the health officer of the school. The physical defects which contribute to malnutrition are usually amenable to correction.

The next most common defect which we have noticed is poor posture. This is very common among girls and almost although not equally as common among boys. It has a definite physiological basis; for barring disease such as rickets, tuberculosis, and infantile paralysis, the inequality of growing and strength of muscles causes a natural amount of postural defect which must be watched by competent physical educators and physicians and proper corrective measures instituted. If this is not done during early adolescence, it is usually too late to do anything for the youth when he comes to college. Corrective gymnastics is usually neglected in high school, but football, never.

Another much neglected part of the adolescent is his eyes. Because of the very active accommodation of a child's eyes, many of the defects with which he is born are not apparent until he reaches high school or college. At this time because he uses his eyes so much and because he needs glasses and hasn't them, he begins to have a series of symptoms which are uncomfortable and sometimes disabling. These symptoms are headache of a dull and persistent character usually located at the base of the brain; styes on the eyelids; eyes that itch, burn, smart or pain; and an inability to concentrate on the subject before him. Observation has led me to conclude that at least ten per cent of all failure among freshmen in college is due directly and solely to eye defects which should have been corrected at an earlier age.

The fourth great defect of the adolescent is emotional instability. One of his most striking needs is for mental hygiene and he has almost no one to turn to for help. The youths do not fill our insane asylums, but a defect should not need to be as wide as a church door nor as deep as a well for us to recognize it. The adolescent presents a peculiar antithesis in his personality: he is at once courageous, honest, likable, energetic, ambitious, high minded; and impatient, vain, jealous, cruel, boring, obscene, even sometimes perverted. Added to this complex personality is the difficult crossing of his own Rubicon. He must first emancipate himself from home often while he is still in high school. Surely this is a problem worthy of our profoundest respect.

There is almost no limit to the amount of your time I could take, but I believe we will gain more if we realize that there is a great want to be filled in helping these young men and women. We must do it in the proper spirit of humility. We must not be like the father who spoke to his son in a reproving manner and concluded with this, "When George Washington was your age he was a Colonel in the English colonial army." If we do, the son might answer, just as the other did, "And when he was your age he was the President of the United States." Youth will not be preached to, but youth will follow an example.

It is the duty of every parent with an adolescent under his care to see to these points:

1. Some one must give the boy or girl adequate sex instruction.
2. A good dentist must have the supervision and care of his teeth.
3. A good doctor must give him periodic health examinations, especially if he is active in athletics, and the doctor's orders must be followed.
4. He must be surrounded with a healthful and happy environment, free from cares and worry, with plenty of time for sleep and rest.
5. He must have an abundance of plain wholesome food, properly prepared and in the proper proportions. His meals should be regularly and tastefully served.
6. He must abstain from strong drinks of all kinds —coffee, tea and alcohol.
7. He must abstain from tobacco and drugs of all kinds.
8. He must have a healthy and normal relationship with other boys and girls.
9. He must be allowed to choose his own business or profession with the help of the best minds he can find.
10. He must have plenty of properly supervised play and athletics.

When you have done this for the high school boy or girl, you have done all that could be expected in our present stage of benighted ignorance of adolescence.

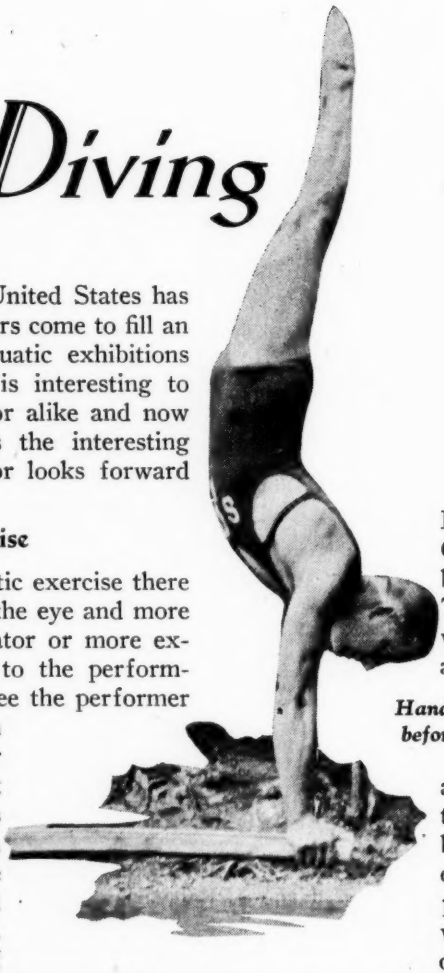
Fancy Diving – a Fine Art

By FRANKLIN B. HOAR
Taylor Allderdice High School, Pittsburgh, Pa.

FANCY diving in the United States has within the last few years come to fill an important place in aquatic exhibitions and swimming meets. It is interesting to the performer and spectator alike and now in all aquatic meets it is the interesting event which every spectator looks forward to seeing.

As an Exercise

Of all the types of athletic exercise there are none more pleasing to the eye and more full of thrills to the spectator or more exhilarating and fascinating to the performer than fancy diving. To see the performer in the meet dive from the springboard into the air with his body under perfect control, perform various turns and twists and then glide gracefully into the water gives a sense of thrill and aesthetic satisfaction. Physically the practice of diving benefits the functional organs, builds strong and supple muscles, perfects the sense of balance, develops an easy and graceful carriage, and develops fine muscle coordination. Mentally it develops courage, assurance, patience, and the ability to think and act quickly. It also gives a natural pride which comes from the mastery of a difficult dive that can be performed exceptionally well only after months of hard and persistent practice.

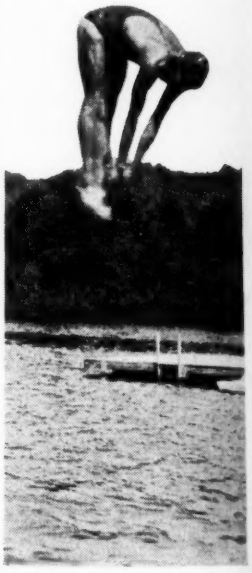


Hand stand. Position before entering water

Equipment

No dives can be learned satisfactorily unless proper equipment is installed and used. One may learn the few fundamental dives on a board only two feet from the water and which has very little spring, but when it comes to the various difficult dives it takes a real board to get the best height for them. In almost all the new swimming pools is being installed the regulation diving equipment. The springboard that is now the official board for the Amateur Athletic Union is the Brandsten Board, devised by Ernst Brandsten, Aquatic Coach at Leland Stanford University. This board is of one solid piece of Oregon Pine. The one meter board is 14 feet long, 20 inches wide, and tapers from 3 inches to 1½ inches at the pool end. It is 39 inches from the surface of the water. The official 10 foot board is 16 feet long, 20 inches wide, and is 10 feet from the water's edge. The boards are mounted on a framework of pipes. Experiments with various fulcrum devices have proved that the pipe fulcrum fastened at the thick end of the board gives the board its greatest efficiency. The depth of the pool should be 8 feet in order to give the diver plenty of depth to finish his dives.

Ready for take off in standing dive



Back jackknife

Preliminary Training

Gymnasium work is beneficial in getting the body in condition for fancy diving. Proficiency is assisted by such calisthenic exercises as bending forward at the waist and touching the toes without bending the knees; stall bar exercises; apparatus exercises; tumbling; and springboard work onto the mats. Tumbling exercises such as forward rolls, front handsprings, back handsprings, front and back somersaults, aid the body in getting the tuck and spin that are required in diving. Some exercises on the horizontal bar are useful, such as the "upstart," where the body is in the inverted jack knife position before coming to the front rest. All these help in getting the finest coordination of the various movements of the body. Now we can go down to the pool and learn to work the springboard correctly. At the

standing position at the end of the board facing the water, execute several continuous springs in place by extending the toes, ankles, and knees, combined with a forceful sideward upward swing of the arms. The body should be kept vertical and the head erect. Try to increase the height after practicing this lift.

The Approach

The approach is performed the full length of the board. The distance should be measured so that the diver is able to ascertain the correct distance to travel to the end of the board for the final jump. The diver steps on the rear end of the board and stands momentarily before taking 3 or more running steps which should be made in a bold, confident manner—a quick, strong and graceful run. On the last step the jump is short and high, enabling the performer to come down hard on the end of the springboard, toes coming within about an inch of the end of the board, but not over it. The spring should be made with the body nearly vertical; the legs and weight of the body should be used to get maximum spring by forcing down and pushing off vigorously with the feet and toes as they leave the board and at the same time stretching the legs out straight and pointing the toes. As the spring is made the arms are thrown into position.

Head Controlling Factor

In all dives, whether plain or fancy, after the body goes into the air, straight or twisting, the *head* is the controlling factor and it is the power that directs the entire body while in flight. Because of its weight and placement the head acts like a rudder, directing the flight of the body and affecting its position at the take-off, during the flight through the air, and on entering the water, so that correct use of it is probably the greatest factor in developing ability.

Essentials

The starting position is the first essential which goes to make a finished artist in diving. This is the position of attention at the lower end of the board.

One and one-half dive, tuck and layout positions
Inset—Close-up of layout position

Swan dive as seen from the front

The approach is the second essential, and should be made in a bold and confident manner.

The take-off is the third essential, and is accomplished by a fairly high jump onto the end of the board, with the spring made from both feet, combined with a shoulder lift, so that a maximum height may be attained.

The fourth essential—form in the air—is the most important part of the dive. It is here that perfect control of the body is needed to make a good dive. As the diver leaves the board, the back should be arched, the head well back, and the toes well pointed. Perfect control in the air as well as grace and coordination are essential.

The fifth essential is the entry into the water. The angle of the entry should be almost perpendicular and the position should be maintained until the feet disappear beneath the surface of the water.

Positions for Standing Dives

The diver steps on the low end of the board and stands momentarily, then walks gracefully to the end of the board, and, if performing a backward dive, executes an about face. The weight is resting on the balls of the feet which are pointing slightly outward with heels together. This gives a tripod effect and permits better balance. The arms may be forward horizontal and shoulder width; may be held over head; held at the sides; and on the hips. The arms in the forward horizontal position seems to be the most preferable and is used by most divers.

Swan Dive or Front Dive

This is one of the prettiest dives performed from the springboard. As soon as the body leaves the board it is thrown into the swan position. The head is held up, not too far back, the arms are held at right angles to the body and slightly over the back, and the body is arched from the head to the feet. The head and feet should be at the same height at the top of the spring. The head is then bent forward, the arms brought in front, fingers together, thumbs locked, and the body straightened for entry. The toes should be pointed.

Faults: Springing out too far instead of up; arms too far back or too far forward; ducking the head and not bringing it up; no arch.

Back Dive

Stand with heels over the edge of board, body erect, head up, arms front horizontal and shoulder width. Bring the arms down past the chest and throw them forcibly up combined with a vigorous push with the legs. The arms go over the head with thumbs locked. Descend by dropping the head. This dive can be performed in the inverted swan position.

Faults: Springing out instead of up, failing to throw head back to descend.

Front Jackknife

As the body leaves the board, the hips are thrown up, the body bent at the waist, the knees straight and toes pointed, and the fingers touching the ankles or the toes.

Running front dive

To descend, the arms are brought forward, the body is held perpendicular, and the thumbs locked.

Faults: Going out too far, holding jack position too long, getting into the jack position too quickly, failing to touch the toes.

Back Jackknife

Take position at end of board the same as in back dive. The spring is made upwards and outwards, bending the body the same as in the front jackknife, and touching the toes. As the body descends it is straightened out for correct entry.

Faults: Jumping out too far instead of up into the air, not touching the toes, bending the knees, twisting the body.

Forward One and One-half Somersault

There are two ways of performing this dive, either in a tucked position or layout position. The accompanying illustrations show the dive at its height in the tucked position and also show the body in the layout position. The tuck is made by throwing the head, shoulders and arms forward, drawing the knees and legs up and catching the lower legs and pulling with the hands and arms. The timing of this dive is acquired by practice. In the layout position the arms are side horizontal with the knees and legs straight. The spin comes with the use of the head in the downward movement and the arms and shoulders in the side horizontal position. This is a very pretty dive and one of the most spectacular. It is performed with ease from the 10 foot board.

Swan dive showing maximum height to be attained

Faults: Failing to tuck, not throwing head down, incorrect timing, not sufficient height.

Isander

This dive can be performed with the arms straight over the head or in the inverted swan position. Spring upward and outward at an angle of 30-40 degrees from perpendicular. As the spring is made the body is arched, with the arms and shoulders thrown back. The body will curve backward and enter the water with the hands leading.

Faults: Head not kept back, chest not thrown out, legs not in line with body in entry, no height, throwing head too vigorously and going too far.

Back Somersault

This can be performed in tucked or layout position. The layout position is preferred. The position is the same as in the back dive. As the spring is made, the

(*To the left*)
Front jackknife

(*Below*)
Isander dive

head and shoulders are thrown back and the arms thrown to side horizontal position. The body is kept arched while turning in the air. The arms are brought to the sides in entering the water.

Faults: Springing out too far, not straightening body for entry, arms held side horizontal in entry.

Hand Stand Dive

An accompanying picture shows the position of the hand stand before entering the water. If one acquires the hand stand to perfection numerous dives can be performed from this position; i.e., the plain hand stand and dive from the 10 foot board, a hand stand and push off to a one and one half, or a neck spring to a one and one half. This position looks spectacular from high platforms.

The dives that have been explained are the more familiar ones which the ordinary high school diver seems to be able to perform most satisfactorily. In collegiate meets one sees more advanced diving, such as the double front and back somersaults, the back to front one and one half somersault, the one and one half gainor, backward one and one half, twisting back one and one half, front and back dives with full twists, and the jackknives with the various twists. There seems to be no limit in the learning of new dives. The development of skill in fancy diving is chiefly a matter of intelligent and frequent practice.

Visual Aids a Helpful Factor

Visual aids in fancy diving are very helpful in analyzing the various movements. The introduction of the 16 mm. motion picture camera is making it possible for coaches to study the different dives as a means of criticism and instruction. During the period of training the slow motion film will reveal the faults and mistakes of individuals in diving, and by showing them their errors in detail it will enable them to overcome such mistakes in the shortest possible time. Sometimes the action in various difficult dives is so rapid that the eye cannot perceive it. Here we find the slow motion camera of great help. In the beginning, slow motion pictures are made of the diver's action, and later another set is made and compared with the first set. This provides one with a critical analysis of the various movements but does not indicate the necessary correction. Next a slow motion picture is made of an expert or champion diver in action. This provides a check list to accompany your own films. Film slides, lantern slides, and photographs are very helpful in teaching this Art of Fancy Diving.

Tuck position, one and one-half dive

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Just Speculation

AMONG the articles that have appeared recently in the *Research Quarterly* there was one by Dr. Stuart Courtis on "The Goals of Health Education" which contained an interesting speculation. In view of the assumption that "each one of us spends many hours, and will increasingly be forced to spend still more hours in small muscle activities in places shut away from light and air," the author goes on to ask these questions:

"Should the goal of health education be the development of the minimum structure that will function perfectly with the minimum of exercise and repair?"

"Is the ideal of the future to be the small-boned, small-muscled, light weight, steel nerved individual who makes adjustments at lightning speed with minimum expenditure of energy?"

At the present time it is quite generally conceded that exercise is essential to the proper functioning of the organs of the body and that since man has been leading an inactive life the organic diseases have mounted rapidly and the mortality toll of late middle age has greatly increased. Dr. Courtis admits this danger when active exercise is neglected, but at the same time advances the possibility that natural selection will operate against the individuals who are susceptible to organic diseases and will leave as the survivors—and as the future human type—those who are seemingly immune to the degenerative diseases even without the recourse to big muscle activities. He does not argue in favor of this viewpoint but merely propounds the question.

On careful thought there seems to be little evidence to support the proposition.

In the first place, it rests on a weak biological position. Regardless of man's superorganic achievements, he still is a biological organism and therefore subject to biological laws. Natural selection operates only during the period of fertility when offspring are being created. It could hardly be an operative factor in organic diseases, for this type of mortality removes individuals only after they are past the childbearing stage. In other words the susceptible individuals would not die off before they had had a chance to reproduce their kind. Natural selection can operate only when it can kill off potential parents before they breed.

If we turn to anthropological data, we find even less support. Ogburn in his "Social Change" shows that man has not changed noticeably in physical structure and characteristics during the past 25,000 years. Other well known anthropologists of today make similar statements. Graham Wallas in "The Great Society" refers to modern man as the "caveman in the modern city."

Even were such a future type possible, man would be foolhardy to assist such a development in any way. Man has survived through all kinds of climatic and geologic changes because he has refused to specialize his body to meet any new situations. Rather he has developed external tools to meet his needs. On the other hand, the paleontological records are filled with the stories of animals that have become extinct because they became too specialized and could not adapt themselves to changing circumstances. For example, horses would become extinct if their environment should become swampy; giraffes similarly if leafy trees could not be found; and tropical animals if an Ice Age were to descend upon them. Man, however, would surmount these difficulties by mechanical means. For those who would like to go to more original sources for a treatment of this thought there is a most entertaining first chapter in Crawford's "Man and His Past."

Man's safety, therefore, seems to lie in preserving his present very generalized features and making all his adaptations to the material world by means of invention. To develop a new type of structure because of a present advantage would prove fatal if some catastrophe descended upon the present man-made environment and placed man again in a primitive state of being. He would then find a fate similar to that of the dinosaurs, sabre-toothed tigers, and other curious animals of whom we learn through excavations and relics exhibited in museums.

No hint of any diminution in size is given in present day anthropometric studies of school children and college students; in fact, the evidence seems to point in the opposite direction.

Even granting that the road to health in the future is destined to be one with no need for "activity, exercise, development," does this relieve us from the responsibility of prescribing exercise today if by this means the lives of useful citizens can be lengthened and made more happy? Civilization has refused to accept the principle of rampant biological determinism. The present generation has placed the stamp of approval upon a policy which will ameliorate and improve to as great an extent as possible the condition and happiness of each individual born into the world. The health and physical education program fits very definitely into this modern social and humanitarian movement. If our program can possibly assist in preventing organic diseases, it is obligatory upon it to make this contribution. And, we must note, exercise does build up bodily functions and prevent atrophy of tissue from disuse.

Prepared by a Committee of the A.P.E.A.

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A Symposium of Preventive and Corrective Physical Education

Dedicated to the Memory of Lillian Curtis Drew

Part II. Objectives *(Continued)*

Conduct Objectives:

The following objectives assume an administrative program which has provided activities specifically adapted to the needs of the physically handicapped individuals who are temporarily or permanently unable to carry on with benefit the regular required work in physical education.

1. To correct existing defects which uncorrected tend to interfere with the educational process and normal living.
2. To reduce handicapping conditions.
3. To restore and maintain organic vigor and skeletal skill to a point where the individual can indulge with benefit and joy in the various "safe sports" suited to the individual's physical capacity and needs. The sports chosen should be those which can be used during the individual's present and adult leisure time.
4. To learn to adapt one's self to one's physical condition and to life conditions in and out of school.
5. To constantly maintain habits of work, rest and play conducive to the best health interests, with foresight to conserve enough energy so that the individual will be prepared to successfully cope with the demands of present and adult life.

Control Objectives:

In order to achieve success in the realization of the above objectives it is necessary that the student take certain steps which are known as control objectives.

1. To have a medical examination at least once each year for the purpose of understanding one's physical condition and learning ways and means of improving this condition.
2. To determine the cause of each handicapping condition.
3. To develop and maintain such interest in "joyous living" that the individual will maintain the correct attitude, have the proper appreciation and follow the necessary health habits conducive to his best health.
4. To prevent the occurrence of physical defects and disturbances which in later life will need corrective or remedial work and which if not corrected tend to act as a handicap to effective living.
5. To develop an intelligent understanding of one's present defect, the cause of the defect and the specific steps necessary for the correction of the defect.
6. To restore one's body to the best possible condition, both physiologically and anatomically.
7. To secure fundamental knowledge of the best health habits, proper appreciation of the value of these habits to one's self, and an attitude of desiring to perform regularly these habits.
8. To select through the medium of "Sports Education" and other big-muscle activities, the activities best suited to one's physical and mental needs and capacity. The selection of these activities should be made on the basis of those which will best provide suitable organic development and which at the same time will furnish a maximum of leisure time material for use during school life and after school days are over.
9. To substitute wherever possible sport activities in place of the more artificial calisthenic exercises, thereby capitalizing interest and increasing carry-over value.
10. To appreciate the fact that organic power, skeletal tone, etc., are necessary for the most efficient performance of the various sports and other big-muscle recreational activities.
11. To be willing to perform certain definite prescribed physical activities (including calisthenics, when necessary) which will develop the necessary organic power and neuromuscular skill demanded by these recreational activities.
12. To cooperate with all worthwhile health agencies, school departments, and parents for the relief of handicapping conditions.
13. To help in bringing about a proper adjustment of school and extra-curricular programs and home activities so that the entire school and home program contributes to the best physical and mental development of the individual.
14. To prevent existing "minor defects" such as weak feet, postural curvatures, etc., from becoming structural deformities, by faithfully performing to the best of one's ability certain prescribed corrective activ-

ities, and giving attention to all influencing factors such as correct shoes, clothing, etc.

Learning Exercises:

Having set up our goals of conduct and the control objectives the next task is the selection of the learning activities which the teacher will ask the student to perform for the purpose of realizing the ultimate or conduct objectives. One example will be given to demonstrate the steps necessary in this procedure:

Conduct objectives—To correct existing defects.
Conduct objectives—To have a medical examination, determine the cause of the defect, develop an intelligent understanding of the steps necessary to correct the defect, etc.
Learning exercise—To go to the doctor for the examination, listen to the doctor's explanation of the cause of the defect, do the various things prescribed by the doctor for the relief of the defect.

The above outline is offered as a solution for the objectives necessary to realize our goals in corrective physical education. Without a doubt certain modifications may be necessary to fit particular situations. In general, however, the pattern stands the educational test and our work is part of the academic work of the institution we represent. It should be our duty, therefore, to follow the accepted educational pattern insofar as it does not restrict our actual therapy work, i e., correcting physical defects.

Certain ages will demand special emphasis. For example junior and senior high school students need stress on normal weight and improvement of organic and skeletal tone. Parenthood should be stressed during ages 13 and 14. The third and last year of high school should stress preparation for earning one's living. Limitations should be pointed out and vocations chosen with a view to one's limitations. The delinquent types in high school are generally found in the rest, nutrition, and corrective classes. The aim of the corrective department for this type is to make them independent so that they may choose wisely their ways of life. On the whole, however, the education pattern which is offered above will be found most satisfactory for a general pattern of conducting corrective work.

Part III. Motivation

In discussing motivation for corrective work it must be understood in the beginning that students who are placed in corrective classes are not usually electing this work. In most instances they are assigned to "corrective" by their physicians for certain conditions with which the student is unfamiliar. In this way the student often finds himself forced to take the least desirable (corrective) activities when his interests are primarily in athletics or some other type of activity. This presents a problem at the beginning which must be met by showing the student that the work in which he is about to participate will be of some value to him. If he is made to see that his activities, his desires, his ambitions may be thwarted and handicapped by his physical condition and he is then shown that he can realize many of his ambitions and goals by improving his physical condition, he then becomes more enthusiastic and willing to work for the correction of his particular defect. Our problem then is to make the student feel more tolerant and even happy in doing this therapeutic work. The feeling that the corrective class is "quite a drop" must be overcome by showing that the work which is done in the special class is an individual type of work especially designed to improve one's physical condition and to make possible his or her more successful participation in the various activities of school life.

For the Teacher:

The greatest sources of motivation for the teacher of corrective physical education are:

1. Knowledge of subject
2. Interest in an understanding of individual students
3. Opportunity to see results

Knowledge:

It is true that knowledge, technique, and skill make the teaching of any subject more pleasurable and interesting. The teaching of corrective physical education is made easier through scientific training and background. Because one is dealing with the individual rather than the group the teacher must rise above the physiological and psychological lassitude of the student.

Knowledge of subject matter and sincere interest in ability to get results are powerful stimuli in overcoming general problems that always accompany the handling and teaching of students who are physically and often mentally "below par."

Interest in and Understanding of the Individual Student:

It is almost too obvious to state, but it is necessary that the teacher of corrective physical education be tremendously interested in the welfare of the individual student. There must be understanding and sympathy for the problems and needs of the individual. At this point it is well to emphasize again the necessity for a complete physical and medical examination of each student so that the teacher will know exactly the type of student he is working with. The health habits, the home life, one's progress in school work—all have a decided bearing on the teacher's understanding of the individual student.

Results:

It is possible for the teacher who is handling small groups to see tangible results. This opportunity to see and get results, the opportunity to see improvement in individual students, is a tremendous source of inspiration and motivation. In handling larger groups one must necessarily use the various measuring devices, achievement tests, etc., to see the result of one's work.

Motivation Methods and Devices to Make Corrective Work Interesting and Vital to Teacher and Student:

1. Complete physical examination—including silhouetteograph picture.

Knowledge of the condition of the student must be a tool of both corrective teacher and student. Regular re-examination can be used to note improvement.

2. Attractive room for work.

Unfortunately in many instances the corrective room

is a room which has been designed for some other purpose and lacks the attractiveness which should be found in work for subnormal individuals.

3. Joy must be essential with the corrective classes.

As the Department of Physical Education is the department in the school to furnish recreation for the students it is most essential that, for the student who needs corrective work, the program functions as a recreational program. It is obvious, therefore, that the room in which one works be of a type which will allow certain play activities. The idea should be gotten over to all physical education people that all their work is in a sense remedial—even *recreative* if they will only see it that way.

The old idea that the corrective teacher must pursue his work with seriousness and often military discipline must be put aside and the element of joy in accomplishment stressed. The interest of the student, conscious effort on his part to correct his defect, the establishment of recreational habits and interests, joyous participation by the student in the corrective activities, and the entire work being administered by a teacher with pleasing personality, often takes the boredom out of corrective work.

4. Records.

Concrete records showing improvement should be used as a source of tremendous interest for both teacher and student.

a. Silhouetteographs
b. Photographs
c. Foot tracing (Not an accurate record of achievement but valuable primarily from the point of view of the interest of student in the improvement of the feet)
d. Health cards and weight records
e. Physical capacity tests
f. Achievement tests
g. Posture tests

5. Use of sports and games.

a. Sports for corrective students should be suited to the age period and should be of the "safe type" within the physical capacity of the student. From the point of view of interest the sport program in corrective classes should be parallel with the sport program in the regular classes. When the regulars are playing baseball, corrective students should be playing playground baseball (with shorter distance between bases and other modifications which may be necessary). When the regulars are playing basketball, corrective classes should play games with elements of basketball.

In connection with sports the modification of correct footwear should not be overlooked. A very lasting lesson can be learned by stressing the need for correct footwear as correct foot function is essential in playing the various games.

b. Great emphasis should be placed on sports with values carrying over into adult life, sports such as volley ball, tennis, swimming, golf, handball, etc.

c. Corrective games are a recent element in corrective work and have become such an important element that a special section of this monograph will be given to this subject.

6. Contact with Parents.

In work with school children, junior and senior high school students, it is absolutely essential that contact be made with parents and strong effort made to get cooperation from the home if one is hopeful of securing the best results in corrective classes. It must not be forgotten that the average parent although seemingly lax in certain phases of the health of the child really has a very strong interest in the child's welfare. It, therefore, becomes the task of the teacher to awaken this interest and use it to the best interest of the child. Special conference with the individual's parents should be requested whenever possible. Letters should be sent to the parents at least once a semester with an invitation to visit the class at definite times. Negative suggestions should not be indicated in any letter sent to the parents. The parent must be shown that there is an opportunity for the child rather than a special need. Parents do not like to think, even in the most outstanding cases, that there is "anything the matter with their children." The letter should contain suggestions for various types of activities that are beneficial for growing children. These suggestions may be in the form of home exercises, home cooperation as to sleep, study, food, etc.

7. Home Exercises.

When the teacher has secured the confidence of the student (not before) one or two exercises to meet the needs of the individual should be assigned for home work. These exercises should be followed up and called for by the teacher at various times. Students should be asked to make notation of their exercise. In fact it is not too much to ask that the student be made responsible for actually learning his exercises. It is the student who should benefit by the exercises and unless the student actually knows the exercises his benefit may be seriously curtailed.

8. Challenge to Difficult Task.

Without being too optimistic as to the outcome of one's physical condition the teacher should be able to draw a mental picture for the student of the good results which may be secured by his work in the corrective class. In many cases this may be a challenge to a difficult task to arouse the student to action. After a student understands that it is a postural defect or another physical condition that *can* be overcome and that the correction will require hard work, a challenge can be given to the student, which is practically always accepted, to do the unusually difficult thing. It is obvious, of course, that the teacher must do some preliminary work in showing the student the value of his corrected condition in terms of accomplishment of the things the student is especially interested in. Not all students are interested in physical prowess. Many students may be appealed to by showing the necessity for better physique as a means of greater earning power.

9. Appeals to Vanity, Pride and Personal Appearance:

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Archery Repairs

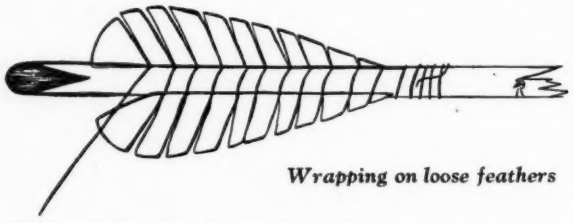
By PHILLIP ROUNSEVELLE

[Fourth of a series of articles. The author is a nationally known archery expert.]

NOW that spring has come it is time for archery instructors to look over their equipment and to see that it is in condition for outdoor use. Of course, the best way to care for equipment is to inspect it in the fall before it is put away. Either send it to some manufacturer for reconditioning or make what repairs you can yourself. Most manufacturers are better able to handle repairs during the winter months than at any other time. As a rule, the costs are less during this period. Keep this in mind for next winter.

Loose Feathers

The most common difficulty you will encounter is loose feathers. Putting on a whole new feather, re-



Wrapping on loose feathers

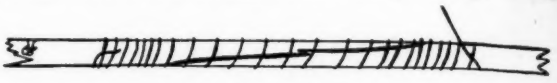
fletching an arrow, is really an expert's job, but it is a simple matter to glue down one or two feathers that have come loose. The best adhesive for the purpose and one that is very handy for many other archery uses is called "Duco Household Cement" and may be obtained from all archery manufacturers and also at many hardware stores. Put a little of this cement on the rib of the loose feather and then wrap the feather down into place with number 36 cotton thread, as shown in the illustration, winding in between the bristles of the feather. Heavier thread may be used but the finer thread is easier to handle.

After the cement has dried, which will be in thirty to forty minutes, remove the thread and with a knife or nail file scrape off any surplus cement. This cement contains a powerful solvent and will dissolve the paint or color on almost any arrow. For this reason it should be handled with care and neatness.

Broken Arrows

If an arrow is not broken off too short, it can occasionally be repaired, using either the cement described above or LePage's glue. The cement is better as it is waterproof and dries quickly, although the glue makes a slightly stronger joint.

Put ample glue or cement on each of the broken pieces and then rub them together until the joint is tight and the pieces match up perfectly. Wrap the arrow with heavy thread or light string, as shown in the illustration, being sure that your wrappings are close together at each end of the break. It is necessary to bind down the broken ends very firmly. Before



Repairing a broken arrow

setting the arrow away to dry, sight down it and see that it is straight. It must be straightened at this time as, if the glue is allowed to dry and the arrow is crooked where the repair is made, the crook will be permanent.

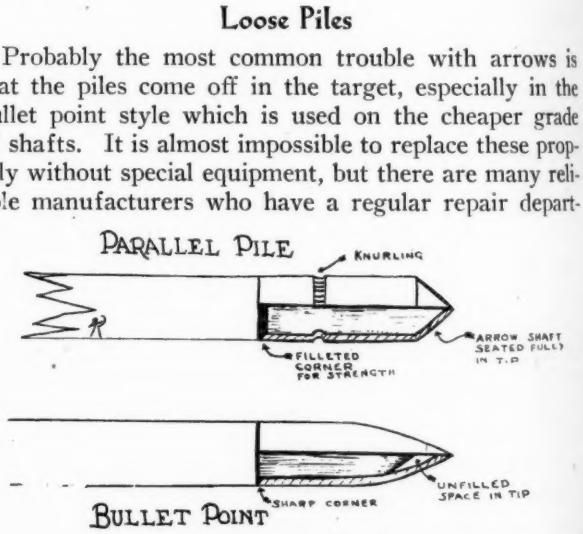
After the cement or glue has dried, remove the wrapping and sandpaper off the surplus adhesive. If the break is shorter than four inches, it is best to put a permanent wrapping of silk thread at each end. After this wrapping is tightly put on, cover it with Duco cement or a little shellac to hold it in place.

Occasionally arrows are split by being hit in the nock by another arrow. The repair is the same, except that it is occasionally necessary to put on a permanent wrapping in a case of this kind.

When footed arrows are broken loose at the foot, which sometimes happens, the repair can be made in the same way. It is important always to save pieces of broken arrows. Doing this will save a great deal of expense in replacement.

Loose Piles

Probably the most common trouble with arrows is that the piles come off in the target, especially in the bullet point style which is used on the cheaper grade of shafts. It is almost impossible to replace these properly without special equipment, but there are many reliable manufacturers who have a regular repair depart-



Two types of arrow points

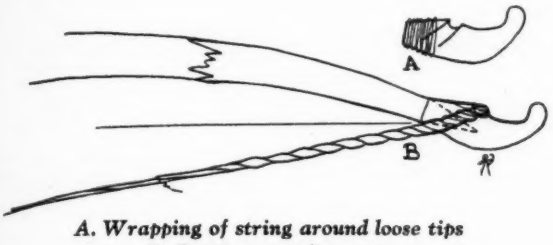
ment for handling work of this and similar nature. The reason that the bullet point so frequently comes off is that it is very difficult to point the end of the arrow shaft so that it will fit exactly in the tip of the point. This poor fit leaves a little space and the first time the arrow hits something harder than usual the point is driven farther on the shaft and then begins to work

loose because the cement holding it has been loosened.

The parallel point is much better because the end of the arrow shaft can be so turned that it will seat snugly in the tip of the parallel point. If the pile is then knurled on the shaft, which also requires special machinery, it should never come off. The best style of parallel point is shown in the illustration, with a little fillet in the back which adds greatly to the strength of the arrow at this, its weakest point.

Loose Bow Tips

Loose tips can be re-glued with either of the two glues mentioned. This can be done even if the tip is



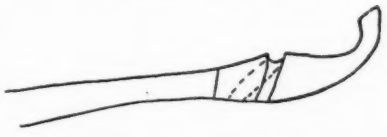
A. Wrapping of string around loose tips
B. Putting on a loose tip

slightly split. In case the tip is split, put a little glue in it and work it into the crack of the split. Then wrap the tip well with thread. It is then glued on the bow just as though it were a perfect tip, as described in the next paragraph.

Put plenty of glue inside of the tip and a little on the tip of the bow. Put the tip in place and bend the bow (string it). The string will put tension and pressure on the tip and hold it on the bow while the glue is drying. At the end of a few hours the bowstring may be removed and, if properly done, the tip will be as firmly glued in place as when it left the shop. Before putting it away to dry, be sure that the tip is properly centered on the bow. It should not be allowed to dry on the bow if it is twisted. After the glue has dried, sandpaper or scrape off the surplus. See that the joint is smooth and even.

Improperly Made Bow Tips

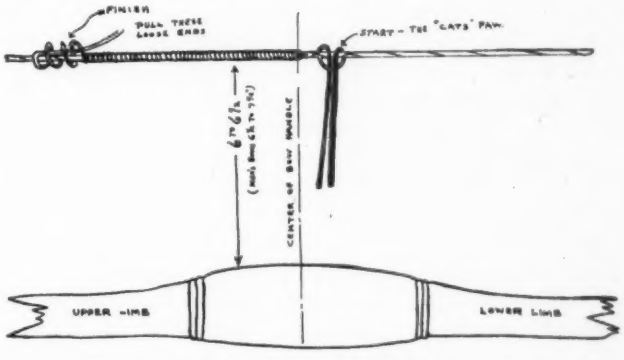
Practically all of the new British bows that I have seen during the last year or two have improperly designed tips which cut the bowstring through at the loop after a very short time. Since a good string costs about a dollar, this fault is a very expensive one, especially as it is rather easy for any manufacturer to rectify. In the illustration the dotted lines show how the tip may be filed out with an ordinary rat tail file to prevent cutting of the bowstring by the sharp edge of the nock. It is much safer to have this done by a manufacturer, but of course it can be done by a competent carpenter or cabinet maker.



How to correct improper bow tip

Serving the Bow String

No bowstring will last even a moderate length of time without a serving on the point where the arrow fits on the string. The best thread for serving string is "Aunt Lydia's Carpet Cotton," for sale at most large dry goods stores. Before putting on a serving, first bend the bow (string it) and see that the string is the proper distance from the handle—six and a half inches for a woman's bow and six and one-half to seven and one-half inches for a man's bow. Rub a little glue on the string for about three inches on either side of the nocking point (where the arrow is put on). Take a double length of the carpet cotton a yard long (six feet altogether) and make a catspaw around the bowstring. To do this lay the bow on your knees, the string away from you, the upper nock to your left hand. Put the loop of the thread through the bowstring away from you and draw it up underneath, pulling the ends of the thread through the loop, as shown



Showing procedure of "serving" the bow string

in the accompanying illustration. Draw this catspaw tight and place it just opposite the center of the bow handle. Rub a little glue on it to keep it from slipping and then begin to wrap the double thread around the bowstring, wrapping away from you and to your left. After you have wrapped about an inch, take an arrow and try it on the string to see that it fits snugly. Most strings are too loose for the arrows and cause the archer to pinch the arrow nock in shooting which, in turn, makes the arrow fall off the bow hand.

Continue wrapping until you have only about eight inches of thread left. Hold an arrow head alongside of the string and wrap the double thread around it once, twice and three times. Now slip the arrow head out, leaving the three loops of the string. Put the ends of the double thread through these loops back toward the serving and then continue wrapping as before. At the end of the third turn, pull the loose ends of the string tight and break them off or cut them flush with the serving. With a little warm water wet the serving thoroughly and then rub a little more glue on it. Take a piece of heavy brown paper and rub briskly over the serving while the glue is still wet. This will make a hard, polished surface and will keep the serving in its place until it is worn out.

Never permit a bowstring to go unserved as it will

(Continued on page 62)

» » Who Shall Teach Physical Education

The Special Teacher . . .

By MARGUERITE BEHRENSMEYER

Department of Physical Education, Washington University, Saint Louis

AT the present time there is considerable controversy among administrators of elementary schools as to the feasibility of a special teacher of physical education. The question is usually stated in terms similar to these: "Why cannot the classroom teacher take charge of the physical education activities?"—"Teachers' colleges and normal schools are requiring courses in physical education which should equip the classroom teacher to handle this phase of her work, so why have a special teacher?"

Ideally the teacher who is versatile and enthusiastic can teach this phase of her work, but in the crowded program of the average classroom teacher something must receive less attention. The general attitude is that a child *will play* and, as a result, children in many elementary schools play without any directed supervision or they are subjected to a routine which must be fulfilled and adds just one more duty to an already overcrowded schedule. At the present time tests and measurements in school subjects have been standardized and are used as a very definite means of measuring progress. Unfortunately this is not true in physical education and for that reason the physical education programs in many elementary schools are not carefully planned and directed if there is no special teacher. It is only natural that the classroom teacher should place the greatest emphasis upon the work which is judged and graded in such a way that it shows what has been accomplished by the group as a result of her teaching. It is as important to plan the play activities of a child to fit his emotional, mental, social and physical needs as it is to plan them for any of his other activities. A teacher trained not only in the psychology of children but with a knowledge of their physical needs, capacities and limitations can plan a more efficient program and one with greater carry-over values than a teacher who has not had this training. The teaching of physical education supposes more than just love of activity and performance. Careful analysis, with an understanding of the learning process of skill is a problem which must be patiently studied and taught. The teacher of a classroom does not have the time to do this even if she wishes, but it is the obligation of a special teacher of physical education to understand and appreciate these facts if she really teaches a child the fundamentals necessary in learning skill in the use of muscles.

Elementary school children, more than any other group, need to be carefully taught and supervised during their play time. Children should be given ample opportunity to choose and make up their own games but it is necessary that someone be in charge who can quickly organize their games, see that no child is left out of a game, help the backward, timid child and help the group as a whole. In the development of skill, the time to start is not when the child reaches junior or senior high school, but when he first begins to play the games which require skill. Unless the individual learns the fundamentals of good form at the beginning, he has a difficult time learning those forms when he is older. Satisfaction comes from doing something well. Many children are handicapped by not doing things well and if they are never instructed or helped during this important formative period their attitude is transferred to a dislike of activities when they reach high school and college.

The physical education teacher in an elementary school must be one who is willing to help the classroom teacher at every opportunity. She must be discerning in finding many opportunities for carrying over the work of the classroom into the play and rhythmic activities of the child. It is important that the special teacher of physical education recognize the untold possibilities that lie in this cooperation of her work with that of the classroom teacher. If physical education is to be education then it must be very definitely linked with the work of the entire school. It is too often something apart and foreign.

It is inadvisable to have many special teachers in an elementary school. Yet the teacher of physical education holds a slightly different position in the eyes of the children. She meets them in an environment which is outside the classroom. The disciplinary problem of the playground is not the same as that which confronts a classroom teacher. The playground is more natural and more conducive to spontaneity and for this reason again the understanding of the nature and needs of the

(*Continued on page 59*)

in the Elementary Schools? « «

. . . The Classroom Teacher

By KATHLEEN SKALLEY DAVIS

Teachers College, Columbia University

THIS subject is presented under the following four divisions:

1. Reasons for the controversy.
2. Trends in modern education.
3. Physical education as an integrated activity in the modern elementary school.
4. The training of the elementary school teacher.

There is considerable controversy over who should teach physical education in the elementary school. Such a controversy arises because: first, in the past, physical education has been considered a special subject; second, because of this, even in the teacher training institutions, elementary school teachers have not been familiar with modern physical education; third, there are some physical educators who still hold that physical education demands a special set of teaching techniques; fourth, many school principals and superintendents have not understood the place of physical education in the child's life and therefore have treated it as another "accessory." Such an understanding has been due to a lack of adequate training and experience.

A satisfactory answer to this question demands a brief consideration of factors which are basic, fundamental, and *peculiar* to the elementary school administrative set-up. This set-up has followed the philosophy of education underlying the entire school system.

At one time educational philosophy gave rise to such outcomes as "minimum essentials," emphasis upon isolated drills, narrow divisions of special subject matter with its attendant special methods, and other efficiency ideals. These outcomes demanded and developed an emphasis upon the curriculum, compartmentalizing each subject and specializing the teacher and the teaching methods.

On the other hand, one of the recognized outcomes of *modern* educational philosophy is that the individual child shall be given opportunity to develop all of his potentialities. Such an outcome demands that the classroom teacher be familiar with all phases of the activities of the school, which today are centered in the child.

From the foregoing discussion, it is obvious that integration of all school activities is necessary for this maximum development of the child. If this is true, physical education must be placed or handled in such a way that it can be integrated with as much facility as the other school activities.

Can this be carried out most effectively and efficiently by the classroom teacher or the special teacher? The question answers itself when one considers such factors as: (1) the most beneficial time for the period; (2) the amount of time and the flexibility of the schedule; (3) the kinds of activity needed; (4) the pupils' reaction to an activity given by a special teacher; (5) the timely inter-articulation of physical education with other school activities; (6) the ease and appropriateness of the generalization of physical education content; (7) the unification of child experiences. Obviously these seven factors point directly to the functions of the classroom teacher. As a matter of fact not one of them suggests the employment of a special teacher.

The problem then becomes one of *how* this integration can be carried on most effectively and efficiently. The method of solving this problem is not difficult. If physical education is to be integrated with the other school activities and if it is to be a part of the child's normal daily life, it must be presented to him in such a way and at such a time that he considers it as he does any other of his daily activities.

This point can best be elucidated by an example taken from an actual situation: *The Place*—a modern elementary school, in which a special teacher of physical education is employed; *The Time*—about eleven o'clock in the morning. The children are deeply engrossed in the solving of a particular problem in social science. They are just about to reach the climax of the morning's work when it must be ended abruptly for it is "time for physical education." The special teacher should not be kept waiting. The children give many evidences of irritation and disappointment at this interruption, in spite of the fact that physical education usually stimulates a pleasant anticipation.

If physical education were an integrated subject in this observed elementary school, taught by the classroom teacher, the climax of the problem in social sci-

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Applying Academic Teaching Techniques to Physical Education

By

ELIZABETH ANDREWS *and* ELISE NELSEN

Members of Faculty, Boston University School of Education, Sargent School of Physical Education

UP to the present time, the average physical director has based most of her teachings upon subject matter. If we are to free ourselves from criticism of the modern educator, we must first emulate academic procedure by placing our focus primarily upon the child, and then through careful and scientific study of the determiners of method, formulate a scheme of teaching techniques. This paper will, therefore, concern itself with an objective approach to the use of teaching techniques in the field of physical education.

In planning a scheme of teaching techniques, it is obvious that all types of method cannot be applied to all motor activities. The skillful teacher is one who comprehends and understands the scope of methodology, and then applies her knowledge to a given situation. She must understand that her work should be based upon objective, rather than subjective thinking. With these precepts in mind, we may now proceed to a detailed analysis of determiners of methods.

Teaching techniques may be considered under three main headings: a. Major Techniques; b. General Techniques; and c. Minor Techniques.

Major Techniques

The major techniques, according to Professor Guy M. Wilson of Boston University, are determined by the nature of the subject matter. They are "drill, for automatic habits and skills; appreciation, for attitudes and ideals; problem, for problem solutions; projects, for vocational and similar life pattern participations." For the purpose of clarifying the use of these terms, the following definitions are inserted:

Drill is that method which involves constant and persistent repetition with the ultimate idea of perfecting automatic responses. These in turn control right habits and skills.

An *appreciation technique* seeks to gain a favorable response to an emotional appeal, in terms of ideals and attitudes.

A *problem* is a purposeful act leading to the removal of a perplexity or the elimination of some other difficulty through the process of reasoning. It is essentially a mental activity.

A *project* is a major technique of teaching which has purposeful activity as its underlying principle. It should be organized on an adult basis, and should have economic and vocational value. A project should be thoroughly motivated before being attempted.

General Techniques

The general techniques are motivation, repetition, attention, association, use, success and readiness. These techniques in their application to teaching techniques are modified by the laws of learning.

Minor Techniques

The minor techniques are those devices with which we are generally familiar: questioning, assignment, review, supervised study, and examination.

Teaching Techniques in Physical Education

A. *Types of subject matter.*
   1. Floor work
   2. Dancing
      a. Folk
      b. Clog and Tap
      c. Social
      d. Classic and character
      e. Natural and interpretive
      f. Athletic
   3. Apparatus, stunts, tumbling and pyramids
   4. Games
   5. Aquatics
      a. Boating
      b. Canoeing
      c. Swimming
   6. Recreational activities
   7. Self-testing activities
   8. Individual correctives
   9. Social service and prevocational activities
   10. Dramatic expression, festivals, plays, carnivals, etc.
   11. Athletics: track and field
   12. Winter sports

B. *Major techniques to use in each*
   1. *Floor work*
      Drill technique: Swedish, German and Danish. Definite response expected as result of definite command.
   2. *Dancing*
      Drill: Folk, clog and tap, social, classic and character, natural and interpretive, athletic.
      Appreciation: Folk, clog and tap, social, classic and character, natural and interpretive, athletic.
      Problem: Folk, clog and tap, classic and character, natural and interpretive.
      Project: Folk dancing (costume making, making dolls.)
   3. *Apparatus, tumbling, stunts, pyramids.*
      Drill: Apparatus, tumbling, stunts, pyramids.
      Appreciation: Tumbling, stunts, pyramids.
      Problem: None.
      Project: Apparatus (building to scale)
   4. *Games*
      Drill: A means toward an end. Highly organized games, such as basketball or hockey. Drill work is present, is essential, but is incidental.

Appreciation: Singing games, nursery rhymes. Correlation with geography. Games of foreign countries, etc. Individual games: golf, etc.
Problem: The problem technique should be used as a method of teaching for all games. Definite application can be made of the five steps in learning, as advocated by Dewey. (A felt need, etc.)
Project: Construction of game courts, such as tennis, basketball, making nets, etc.

5. *Aquatics*
Drill: Boating, canoeing, swimming
Appreciation: Boating, canoeing, swimming
Problem: Planning canoe trips, etc.
Project: Building of boats, etc.
6. *Recreational activities:* Hunting, fishing, hiking, etc.
Drill: None.
Appreciation: All.
Problem: All.
Project: Yes, in some phases. Making fishing pole, lobster traps.
7. *Self-testing activities. Motor ability.*
Drill: Incidental—in order to perfect motor skill.
Appreciation: Interest is present, in personal advancement.
Problem: Yes, to increase motor skills.
Project: None.
8. *Individual corrective*
Drill: Yes—essential.
Appreciation: Value of good posture.
Problem: Increase physical efficiency.
Project: None.
9. *Social service.* Scouting, as an example.
Drill: Incidental—learning knots, etc.
Appreciation: Very decidedly.
Problem: Yes, making maps and house plans.
Project: Yes, making and selling scout cookies.
10. *Dramatic expression*
Drill: Yes, but incidental. Learning parts of play.
Appreciation: Good plays, etc.
Problem: Yes, scenery, properties, etc.
Project: Making scenery, costumes, etc.
11. *Track and Field*
Drill: Essential, but can be incidental.
Appreciation: Yes, doing for the sake of doing. Olympics.
Problem: Yes. Conducting meets, etc. Application of laws of physics:—gravity, etc.
Project: Making and preparing equipment:—jumping pits, etc.

C. *Right Use of General Techniques in Each. Illustration. Games.*

1. *Motivation*
Drill: To teach child to apply intelligently the details of game work, and to form correct response bonds.
Appreciation: Watching skilled players leads to desire and choice.
Problem: Teacher and children working out detailed techniques that will improve skill in playing.
Project: Feeling of need.
2. *Repetition*
Drill: To insure correct responses, and correct performance of game skills, during the learning period, to be applied when game is actually played.
Appreciation: The use of a variety of game forms, employing identical techniques. Result is appreciation of acquired skills.
Problem: The use of a variety of game forms, employing identical techniques.
Project: None.
3. *Attention*
Drill: To obtain immediate and correct response to command.
Appreciation: Interest and attention used as a guide toward formation of right habits, ideals and attitudes.
Problem: Allowing children to formulate their own techniques in teaching, guided by teacher.
Project: Child achieves because of satisfaction in seeing results of his own creative impulse.
4. *Association*
Drill: Use such game terminology as will occur in a real game situation.
Appreciation: Previous teaching of right techniques builds up an appreciation of a good game.
Problem: By allowing child to gather his own data, to weigh and organize, he thereby forms associations which aid in solving problems.
Project: Identical elements used successively in different projects aid in associating right ideas which carry over.
5. *Use*
Drill: Present satisfacton. Acquisition of habits and skills related to future life, justifies the use of drill.
Appreciation: Development of subtle situations.
Problem: Each problem solved gives an impetus and desire for further thought-provoking situations.
Project: Child must see relation to future adult needs on vocational and economic basis.
6. *Success*
Drill: Success is assured, when drill is not carried beyond point of need.
Appreciation: This comes when child can recognize good playing.
Problem: Success in problem solving is achieved when the child is enabled to better handle the next problem.
Project: Success is achieved when there is definite completion and economic gain.
7. *Readiness*
Drill: Readiness is possible when a receptive mood has been established by satisfying the objective use of drill.
Appreciation: Preliminary building of correct ideas and attitudes i.e., good sportsmanship.
Problem: Experiencing satisfaction is solving of previous problems.
Project: Must have experienced previous success, in order to achieve right mental set.

D. *Right Use of Minor Techniques in Each. Illustration. Games.*

Drill: 1. Questioning. 2. Review. 3. Examination.
Appreciation: 1. Questioning. 2. Supervised study.
Problem: 1. Questioning. 2. Assignment. 3. Review. 4. Supervised study. 5. Examination.
Project: 1. Questioning. 2. Assignment. 3. Supervised study.

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The demand for back copies of the Journal for the months listed below has not yet been met in full. Our own supply is entirely exhausted. We are appealing to members who have copies of these issues which are no longer needed to send them in; many newer members will welcome an opportunity to read them. *30 cents for each copy* of "Health and Physical Education" for *February, 1931, January, 1931,* and *October, 1930,* will be paid when they are received at the address below. We simply ask that they be wrapped securely or put in a large, heavy envelope.

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Around the Country with J. E. Rogers

The National Recreation Association is celebrating its twenty-fifth anniversary this year. This association was formed at a meeting at the White House, Washington, D.C., April 12, 1906, when Theodore Roosevelt was President. In 1906 only a dozen cities provided for municipal recreation from municipal funds. Today 1000 communities have community recreation programs. To celebrate the occasion of the twenty-fifth anniversary of the organization, the Board of Directors had a meeting at the White House Monday, April 13, as guests of President Hoover.

* * *

Richard F. Hayden, Rutland (Vermont) High School, actively participated in the formation of a Vermont State Physical Education Association last year.

* * *

Mr. J. Fred Bohler of the State College of Washington, Pullman, president of the Northwest District, formed last year at Spokane, attended the national meeting at Detroit. Mr. Bohler is director of the Department of Health, Physical Education and Athletics.

* * *

Mary C. Coleman, Director of Physical Education, North Carolina College for Women, Milledgeville, is President of the Southern District. She is making great plans for the next meeting.

* * *

Miss Tommie Reynolds, State Teachers College, Murfreesboro, Tennessee, participated with Alf Miles of the Y. M. C. A. College, Nashville, in the formation of the Tennessee State Teachers Association at a meeting in Nashville, April 1-4 during the State Teachers Association meeting. Dr. Miles writes:

"We had the physical education group meet during the State Teachers Association meeting here in Nashville. There were fifty or more at this meeting, which was a very good representation of the state physical education teachers.

"The constitution that I presented was approved and adopted and the following officers were elected: president, Dr. A. B. Miles, Y.M.C.A. Graduate School, Nashville; vice president, Miss Dorothy Toleson, Peabody College, Nashville; secretary-treasurer, Miss Elsie Jobe, Tennessee Polytechnic Institute, Cookville, Tenn.; two members at large, Dr. Shelton Phelps of Peabody College and Miss Tommie Reynolds of the State Teachers College."

* * *

Mr. Hugo Bezdek is director of the School of Physical Education and Athletics at the Pennsylvania State College. He is developing a four year major course in physical education.

* * *

Carl Schrader, Director of Physical Education, Commonwealth of Massachusetts, is national chairman of the Physical Education Committee of the National Congress of Parents and Teachers. The P.T.A.'s over the country have taken a great interest in the development of health and physical education. They have helped in the development of state programs and state directors.

* * *

The American Legion has done much to promote physical education in education. Its members have been most active in obtaining state physical education laws and state directors of health and physical education. Mr. Russell Cook, Director of the National Americanism Committee has been doing much. In a recent visit to Richmond, Virginia, he was quoted in the Richmond News Ledger as follows: "Realizing that physical development among the youth of the country is way below par, basing this statement on the fact that 35 per cent of the men drafted in the forces of this country during the world war were rejected because of physical disability, state departments have been asked to start campaigns on character building and physical development in the schools of their respective states. The Legion favors a minimum program of compulsory physical education in the public schools which will require at least one hour per day for three days a week, or its equivalent. Legislation to bring this about will be sought by the Legion in all states where such laws are not now operating."

Elmer Berry, formerly of the Y. M. C. A. College, Springfield, Massachusetts, and now Director of the International Y. M. C. A. School in Geneva, Switzerland writes this note: "Here things are moving on as well as we could expect. We have a new school home this year in which we 'hang out' for the next eight or ten years, at any rate. There are twenty-four students at school from fifteen different countries and we are enjoying our work greatly."

* * *

Emil Rath, Blanche Trilling and Dr. C. O. Molander were re-elected officers of the Midwest District at Detroit.

* * *

Dr. Goodwin Watson of Columbia University made a splendid speech at the banquet of the National Progressive Education convention of the Department of Superintendence, Detroit, Thursday, February 26. He spoke of the great need for a recreation program in secondary education. To quote from the Detroit News: "Seven departments, or rather 'trunk lines of experience,' " would be provided for in Dr. Watson's ideal high school, he said. "These would be health, personal relations, vocations, money and goods, the social order, recreation and the interpretation of the universe. There would be no formal classes. Each morning the pupil would report to his counselor and plan his work for the day, which he would carry out either singly or in a group. Printed materials, books and equipment would be ready for his use. When he became puzzled with some problem he would go to the expert in the field concerned and ask questions. And the teacher would actually try to answer them.

"Teachers in the health department, for example, probably would be asked if hair tonics are good for dandruff. They also might be asked what causes cold epidemics, why maternity mortality is so high, the effect of noise on nervous systems, how to avoid goiters, what to do for burns, if basketball is a healthy game, are drafts really to be avoided or is that just an old-fashioned idea? All of these things you see, have to do with life. Is it too revolutionary to suggest that we try to teach them?"

* * *

Louis Kulcinski, State Director of Physical Education in Illinois, has made plans for the organization of the Illinois State Physical Education Association.

* * *

F. W. Luehring, formerly Director of the Department of Physical Education and Athletics at the University of Minnesota, is now at Columbia University taking his Doctor's degree, which he hopes to complete this year. He is making a study of swimming and swimming pools.

* * *

The state of Pennsylvania is doing much in the development of a state program of health and physical education. State Director W. G. Moorhead reports 1187 full time teachers, 620 part time teachers, making a total of 1807 teachers in Pennsylvania.

	Full Time			
Subject	Elementary	High School	Elem. & H. S.	Total
Health	61	63	11	135
Physical Education	189	679	107	975
Health and Phys. Ed.	9	56	12	77
	259	798	130	1187

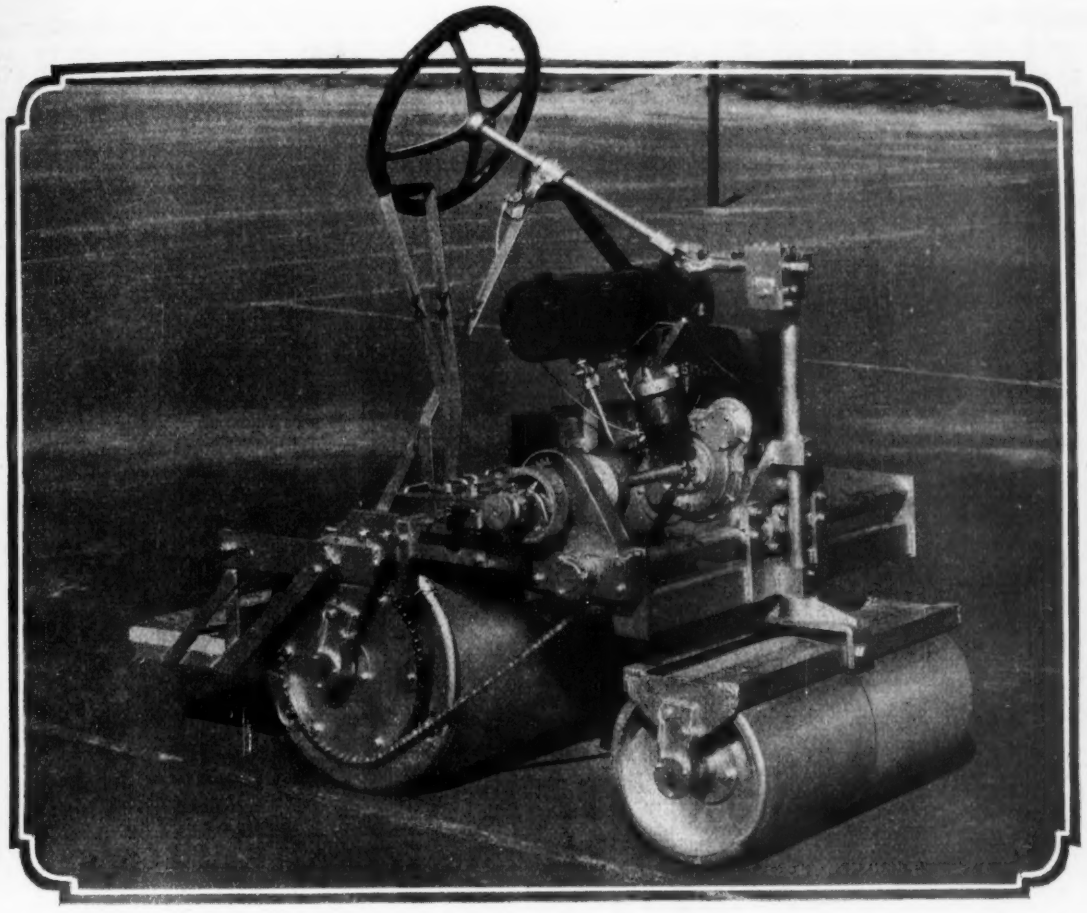
	Part Time			
Subject	Elementary	High School	Elem. & H. S.	Total
Health	148	250	5	403
Physical Education	46	135	5	186
Health and Phys. Ed.	3	26	2	31
	197	411	12	620

* * *

Mrs. Jane Deeter Rippen, formerly executive head of the Girl Scouts of America has been elected president of the Women's Division of the National Amateur Athletic Federation.

* * *

Mr. V. S. Blanchard is director of the Department of Health and Physical Education in Detroit which has a staff of 607 teachers.



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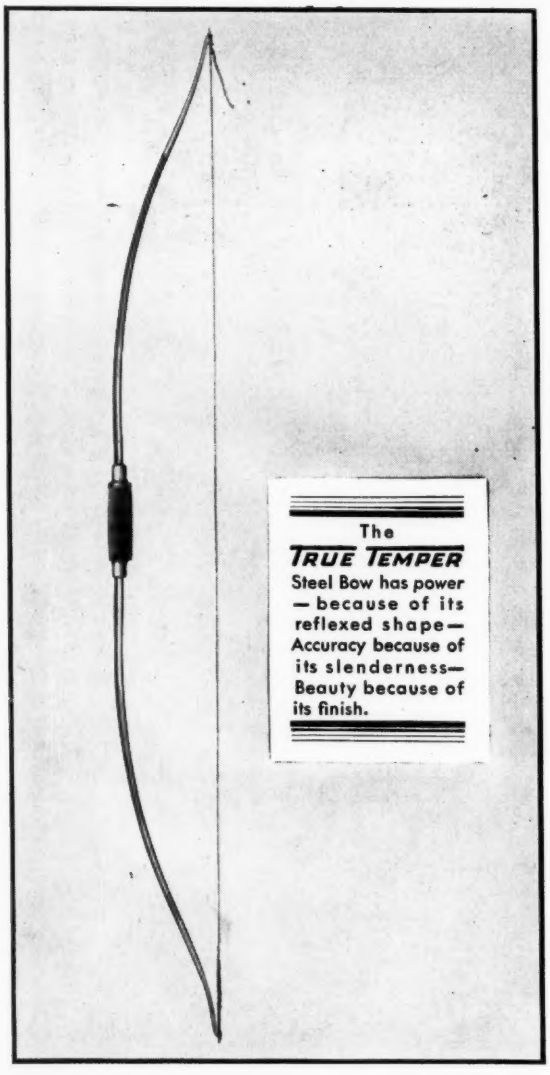
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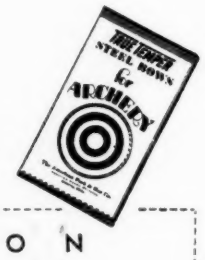

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A Health Project

By
RHODA C. SCHWIEG
Vice Principal, Hawthorne Avenue School
Newark, New Jersey

LAST FALL we decided to undertake a "health project" in our school with the idea in mind of creating the right attitudes towards health knowledge and practices. Our school is organized on a 24 class platoon plan and each class reports to the auditorium. Health has been stressed as one of the subjects in the auditorium work. However, there had been no definite check-up to see how much of it was understood and applied. Therefore, in order to get a starting place for our work it was decided to give a true-false test of 100 questions to four classes. Classes $6A^{11}$ and $7B^{9}$ were selected for the experimental work as they reported to the auditorium at the same period. Classes $6A^{10}$ and $7B^{8}$ were selected as the controlled group.

The test covered a wide range of health knowledge and habits, and dealt chiefly with the following topics: physiology, elimination, food and food habits, exercise and posture, sanitation and prevention, mental hygiene, sleep and rest, safety and first aid, hygiene of the special organs (eyes, teeth, nose, throat, ears, feet), alcohol, narcotics, drugs, fresh air and sunshine, and cleanliness.

The papers were scored and the group average for the four classes was found to be 76.8%. The experimental group (classes $7B^{9}$, $6A^{11}$) averaged 75.3% while the controlled group ($7B^{8}$, $6A^{10}$) averaged 78.5%. There was a total of 167 pupils taking the test, distributed as follows: 50 in $6A^{11}$; 38 in $7B^{9}$; 45 in $6A^{10}$; 34 in $7B^{8}$.

The results were interesting, as the following tabulation shows:

CLASS AVERAGE OF ERRORS PER QUESTION

	Frequency of Occurrence	$7B^{9}$—$6A^{11}$ Experimental	$7B^{8}$—$6A^{10}$ Controlled
Physiology	9	34.3	27.8
Elimination	3	29.7	27.3
Food and Food Habits	25	26.2	21.4
Exercise and Posture	4	25.8	21.0
Sanitation-Prevention	10	25.6	16.4
Mental Hygiene	3	25.0	25.0
Sleep and Rest	6	20.5	17.9
Safety and First Aid	3	20.3	17.7
Hygiene of Special Organs	19	17.4	11.5
Alcohol-Narcotics-Drugs	4	17.3	10.3
Fresh Air and Sunshine	8	12.5	—
Cleanliness	6	3.5	2.7

In each case the experimental group had a frequency of error greater than the controlled group.

In the tabulation of frequency of errors by questions it was found that 141 children failed on No. 26, which stated that if you eat fish and ice cream at the same meal you will probably get sick. Question No. 22 was missed by 123 children. This stated that the saliva in the mouth is important in digesting meat. 120 children marked the statement that "the best way to cure constipation is to take castor oil once a week," as true, as well as the statement that milk contains all the important food elements but calcium. The statement that every day growing boys and girls should eat food containing about 1000 calories was thought to be true by 114 pupils. 104 children thought that the only place where digestion goes on is in the stomach. 93 pupils thought that it was bad for their digestion to eat ripe cherries and to drink milk on the same day, while the same number did not realize that potatoes and corn are carbohydrate foods. It was rather surprising to note that 92 children marked as true the statement that the correct way to stand is with the heels together and toes far apart. "Breathing through the mouth is bad because it is likely to cause stomach ache or earache" was thought to be true by 88 children. The results of the other statements were equally interesting but only the ten questions which had the largest number of failures are cited by way of illustration.

In order to have an adequate measure of the mental ability of the pupils of these four classes, an intelligence test was given. We used the Otis Self-Administering Test. Here again we found that the controlled group was superior to the experimental group. Class $6A^{11}$ of the experimental group had a range of scores from 13 to 64 and I.Q.'s from 59 to 137. Class $7B^{9}$ of the same group had a range of scores from 20 to 70 with a resulting range of I.Q.'s from 77 to 135. Class $6A^{10}$ of the controlled group had a range of scores from 26 to 61 with I.Q.'s from 89 to 130 while $7B^{8}$ of the same group had a range of scores from 28 to 58 with I.Q.'s of 83 to 137. The range of scores in the controlled group was not as great as in the experimental group.

Our nutrition teacher, Miss Helen Walton, weighed both groups. Here again the controlled group was superior to the experimental group, as the following tabulation shows:

WEIGHT RECORD

	Experimental $6A^{10}$—$7B^{9}$	Controlled $6A^{10}$—$7B^{8}$
Normal	57 — 74%	57 — 80%
Underweight	15 — 19%	9 — 13%
Overweight	5 — 7%	5 — 7%
	77	71

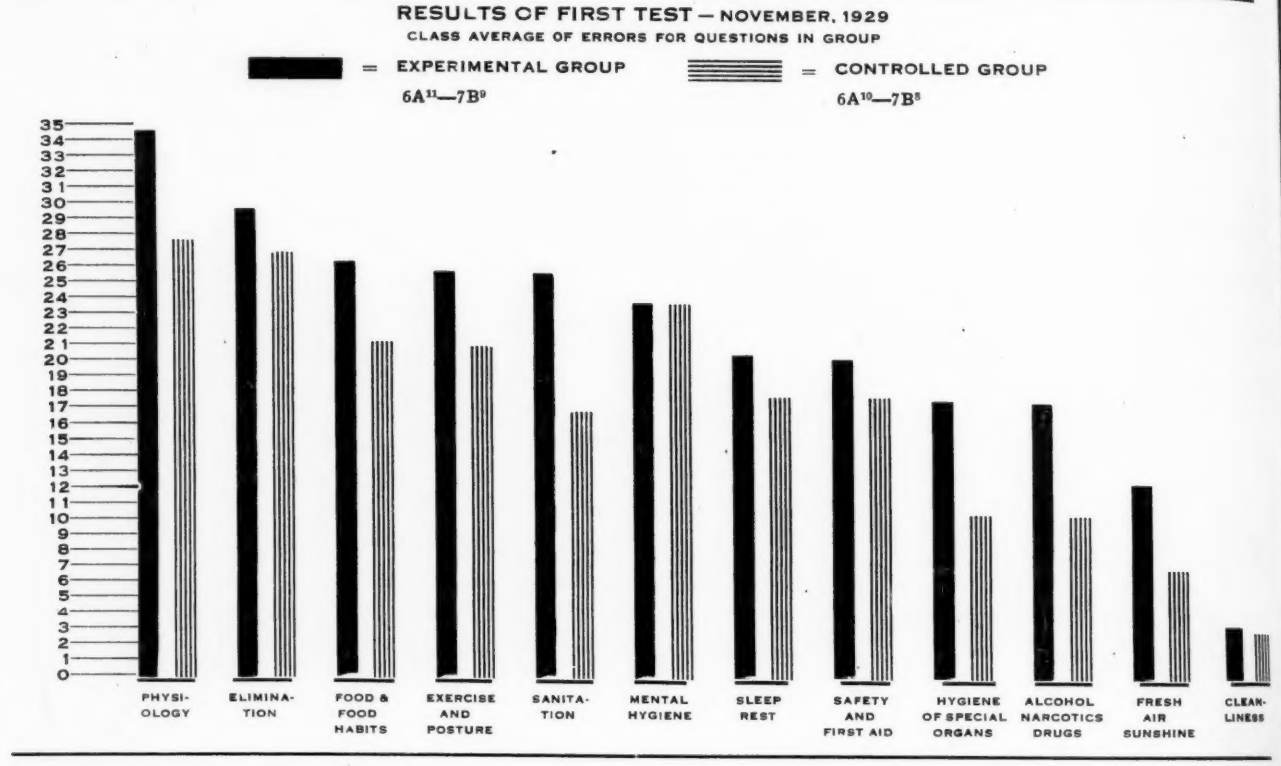
Our school physician and nurse cooperated with our project splendidly. Each child was given an examination, defects listed, and the cooperation of the parents was secured. Special examination of their teeth was also made, as our school was one of three selected for a dental survey by the Medical Department.

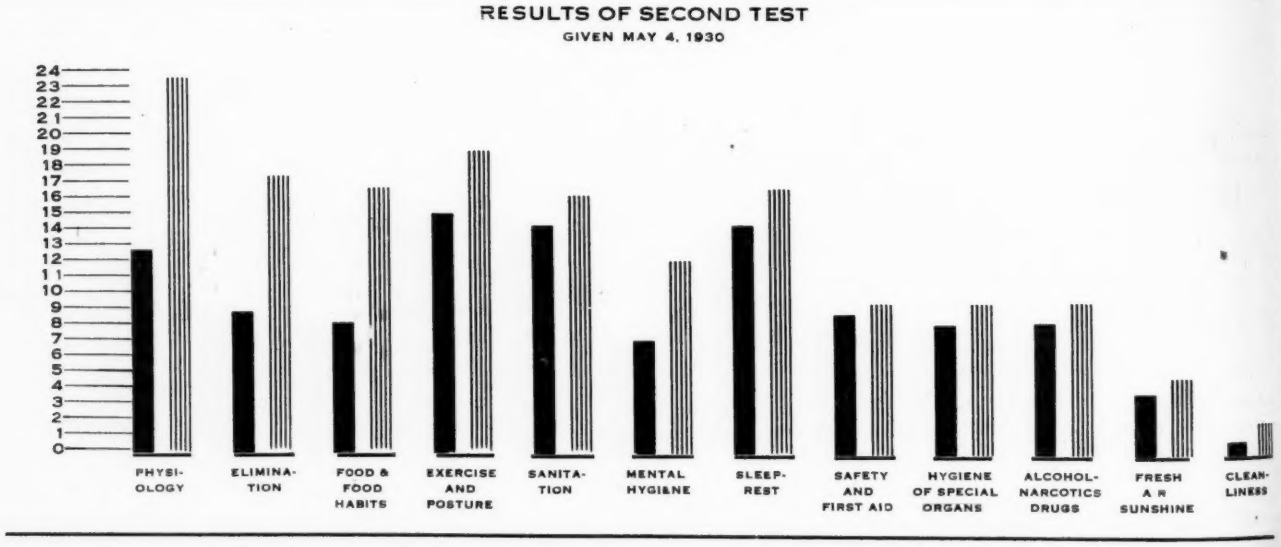
Our aim in planning this phase of the work was not to secure 100% to the answers of the test, but to arouse an interest, in the children and teachers, for the need of

definite health instruction and to establish health habits and knowledge. Having assembled all the facts our task was to apply remedial instruction, based on the results of the test that was given.

Miss Walton undertook the teaching of the health work. Since 6A[11] and 7B[9] came to the auditorium at the same period, the lesson was given there one period a week. Work did not get under way until the beginning of December. This plan was continued until the end of the term in January. A series of lessons on milk was first presented since so many of the pupils had failed on questions concerning milk. Next the topic of adequate meals was discussed with the children. During this time the home room teachers were acquainted with our plans and purposes and their aid solicited. Health clubs were organized and officers were elected. However, it was not until the beginning of the new term, which started February 1, that our real work began. Due to a change in the program our two experimental classes did not meet at the same period in the auditorium so the work was transferred to the classroom. This proved by far a more satisfactory plan as it gave the home teacher an opportunity to know just what was being presented and greater correlation could be secured.

In our work with the health clubs we have not super-





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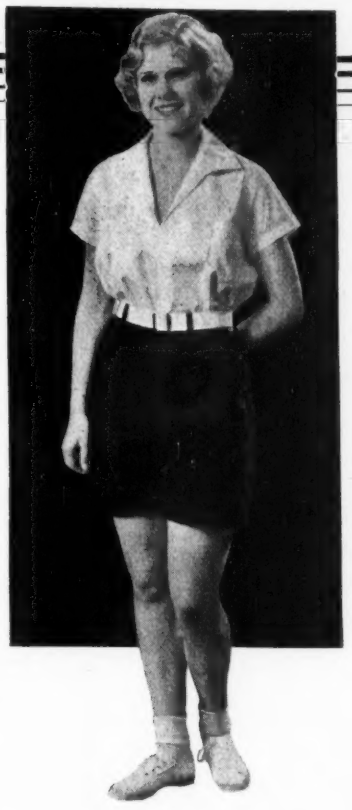

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imposed our ideas upon the groups but have allowed them to name their committees and take up the things that interested them. Each club has at least ten committees which cover a wide range of activities. Meetings are held once every two weeks, at which time all have a chance to participate in some way. Diaries of health habits have been kept and the children have made graphs of their progress. Original plays written by the children, dealing with safety and health, are presented at each meeting. The classes had gathered such a wealth of material that they published a "health issue" of our school magazine, "The Hilltop." This proved a tremendous success and was a means of arousing and stimulating an interest in health for the entire school. It is rather interesting to note that the supply of "Hilltops" was exhausted on the first day and it is no boast to say that several hundred more could have been sold. The health clubs conducted a health information contest for all the classes of the school, and offered a prize to the best answers to the series of questions which they had formulated. This contest was the idea of the seventh grade group and it also was a means of creating an interest in health for the school.

Through the work of the health clubs, the home room teachers have found abundant material for composition work. They no longer are at a loss as to what to choose for the week's discussion. Composition and letter writing have been made real. These groups have written to all parts of the United States for health information and now are writing to children in Hawaii. The health club work is a splendid means of improving oral English. The classes have enjoyed making up their own arithmetic problems based on health and safety statistics which they have gathered from various sources. Their work in the art and drawing departments has reflected their interest in health as shown in their poster work.

The group at present is tremendously interested in watching the effect of diet upon six rats. One pair is being fed an adequate diet consisting of whole wheat bread and milk, two-thirds of the diet bread and one-third milk. The second pair has a diet of whole wheat bread and coffee, to show the effect of arrested growth when the diet contains no milk. The third pair is being given a diet to show how growth is retarded when an excessive amount of sugar crowds out some of the milk from a diet. The experimental diet being used consists of 200 grams of 100% whole wheat flour, 70 grams of sugar and 30 grams of whole milk powder and 4 grams of salt.

These are but a few of the high spots of our project, but will give some idea of the extent of our activities.

On May 4th, we re-tested the groups with the following results. The experimental groups, known this term as $7B^9$ and $7A^7$ averaged 88.3% while the controlled group averaged 83.8%. A total of 167 children took the test. It was with a great deal of satisfaction that the experimental group this time scored fewer errors in every instance, as the following tabulation will show:

CLASS AVERAGE OF ERRORS PER QUESTION

	Frequency of Occurrence	$7B^9$—$7A^7$ Experimental	$7B^7$—$7A^9$ Controlled
Physiology	9	12.55	23.77
Elimination	3	9.0	17.33
Food and Food Habits	25	8.25	16.88
Exercise and Posture	4	15.0	19.0
Sanitation and Prevention	10	14.6	16.2
Mental Hygiene	3	7.3	12.0
Sleep and Rest	6	14.66	16.5
Safety and First Aid	3	9.3	9.56
Hygiene of Special Organs	19	8.4	9.47
Alcohol, Narcotics, Drugs	4	8.5	9.75
Fresh Air and Sunshine	8	4.25	5.63
Cleanliness	6	.08	2.16

Taking the four classes together statement No. 22 received the highest number of failures this time, a total of 118, of which 44 were made by the experimental group, and 74 by the controlled group. This statement was that the saliva in the mouth is important in digesting meat. "Poison ivy leaves have five leaflets" was thought true by 92 children this time. Another statement to receive a large number of errors was the one which asserted that growing boys and girls should eat food containing about 1000 calories. The controlled group made 60 errors while the experimental group made only 28. The question again of correct posture was marked wrong by 85 children. 75 children still believed that it is harmful to eat fish and ice cream at the same meal. More failures were recorded on this question in the first test than on any other. The statement "the best way to prevent constipation is to take a dose of castor oil once a week" ranked third in the number of errors in the first test with a total of 120, while in the second one it ranks sixth. 74 children still believed it true. 60 children failed on the statement that when you are lying down asleep your body is not working as hard as when you are sitting studying quietly. "Being vaccinated is a good way to keep from having diphtheria" was considered a false statement by 59 children this time. "Potatoes and corn are carbohydrate foods" was scored wrong by 58 children, 38 of whom belonged to the controlled group. 57 children did not know that it is a good thing to wash with a strong laundry soap if you have been exposed to poison ivy.

In the first test, there were no questions which everyone answered correctly. In the second test three statements were scored correctly by every child. They were as follows:

1. If a boy or girl plays out of doors one or two afternoons a week, it is all right to go to the movies on all other afternoons, if the movies do not cost too much.
2. One reason why you should keep your hands away from your face is that there may be disease germs on your fingers.
3. It is all right to keep the windows closed for warmth at night in the bedroom.

In the first test the highest number of errors recorded for any statement was 141 while in the second test the highest number was 118. The lowest figure for the ten statements where most failures occurred was 92 in the first test as compared with 57 errors in the second

test. Further comparisons might be made but enough have been given to show an improvement in the work.

To those of us who have worked with these groups the results of this test are most gratifying. It was impossible to teach all the subjects in the short time allowed for this work. As we stated at the beginning we were not nearly so concerned with teaching the answers as we were in establishing definite health knowledge, habits and practices. In fact, the only direct discussion of the statements was made at the conclusion of the first test when the papers were gone over with the group.

The children were examined by our school doctor and nurse recently and have improved physically. Most of the underweight group have gained and 18 children of this group have brought in slips from their own dentist, stating that their teeth were in perfect condition. The rest of the group are all working for O.K. slips for their teeth.

Taking the project as a whole, the results have been far reaching. We feel that we have aroused a permanent interest in health knowledge and practices not only in the experimental groups but throughout the whole school. A visit to one of the health clubs would readily convince anyone that the interest which has been created is genuine. Through our health clubs we have been able to reach and help several "problem children" to such an extent that they have ceased to be "problems."

We feel that this project has been very worthwhile inasmuch as it has blazed a new trail for us in planning further health instruction. From the data obtained it will be possible to extend our activities to other grades.

In conclusion I should like to express my sincere appreciation to the home room teachers, Miss Estelle Coleman and Mr. Harold Wagenheim; to Miss Helen Watson, our nutrition teacher; to our school doctor, Dr. Fein, and our school nurse, Miss Agnes O'Neill, for their splendid and hearty cooperation. Without their capable help, the results of this project would not have been so splendid.

True-False Test for Pupils

Directions—If statement number 1 is true, encircle the T, but if it is false, encircle the F. Do the same for all the statements.

1. A luncheon of bread and butter, macaroni and cheese and rice and raisin pudding is better for boys and girls than a luncheon of cream of tomato soup, crackers, peanut butter sandwich and an orange. T F
2. Milk has all the important food elements in it but calcium. T F
3. If a boy eats green vegetables and drinks milk, he is more likely to grow strong than if he eats only meat, potatoes and bread. T F
4. Candy should be eaten only at the end of a meal. T F
5. Green leafy vegetables and fresh fruits are rich in vitamins and minerals. T F
6. Every day growing boys and girls should eat food containing about 1000 calories. T F
7. The potato is an important starchy food. T F
8. An orange, a glass of milk, and hot cooked whole wheat cereal is a better breakfast than an orange, a glass of milk and puffed wheat. T F
9. Potatoes and corn are carbohydrate foods T F
10. Hot cinnamon rolls or white rolls, fresh and hot, are the best kind of bread for boys and girls. T F
11. It is easier and more effective to get vitamins from yeast and vitamin tablets than from fruits and vegetables. T F
12. Whole wheat bread is good for boys and girls even if it has a tough crust. T F
13. Spinach is a good food because it is rich in vitamins and iron. T F
14. Drinking milk and playing in the sunlight help to make straight bones. T F
15. One reason why it is a good thing to keep milk in the ice box is because bacteria do not grow so fast in a cold place. T F
16. Boys and girls should eat breakfast in a hurry and run to school so that they will not be late. T F
17. Boys and girls should eat their meals without laughing and should plan their school work while they are eating. T F
18. Milk turns sour because of bacteria in it. T F
19. Milk turns sour because of thunder. T F
20. Lime is found in milk and is needed for building strong bones. T F
21. Butter and cream are fatty foods. T F
22. The saliva in the mouth is important in digesting meat. T F
23. It is bad for your digestion to eat ripe cherries and to drink milk on the same day. T F
24. The stomach is the only part of the body where digestion of food goes on. T F
25. One reason why food should be chewed thoroughly is to mix it with saliva and give the saliva a chance to start the digestion of the food. T F
26. If you eat fish and ice cream at the same meal you will probably get sick. T F
27. A luncheon of a ham sandwich, a sack of salted peanuts, and a chocolate ice cream cone is a wholesome luncheon for school children. T F
28. The same vitamin is found in orange juice and in tomato juice. T F
29. The temperature in the school room should be from 65 degrees to 68 degrees Fahrenheit. T F
30. Breathing through the mouth is bad because it is likely to cause stomach ache or earache. T F
31. If a boy or girl plays out of doors one or two afternoons a week, it is all right to go to the movies on all the other afternoons if the movies do not cost too much. T F
32. Girls should not play in the sunshine because they get sunburned and freckles. T F
33. Bright sunlight helps make plants and boys and girls grow. T F
34. Boys and girls should get their lessons immediately after school and should not play out of doors until after supper when the lessons are done. T F
35. Twelve year old boys and girls do not need to sleep more than eight hours every night. T F
36. It is better to sleep lying on the side than flat on the back. T F
37. The heart beats faster when you are lying down than it does when you are sitting up awake. T F
38. It is a sign of good health to wake up in the morning feeling rested and ready to get up. T F
39. When you are lying down asleep your body is not working as hard as when you are sitting studying quietly. T F
40. It is all right to keep the windows closed for warmth at night in the bedroom. T F
41. It is not necessary to have a bowel movement before going to school if you feel that you don't need to. T F

(Continued on page 60)

PHYSIOLOGY
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PHYSICAL EDUCATION

ARTHUR H STEINHAUS
Professor of Physiology and Director of the Y.M.C.A. College Laboratory for Physiologic Research in Physical Education, Chicago

7. Tonus Reflexes and the Problem of Corrective Gymnastics

The series of which this article is one is an attempt to present and interpret to physical educators the results of some recent researches in Physiology which to the writer seem of importance to Physical Education. The articles cannot lay claim to scientific thoroughness. They must rely on their simplicity and essential accuracy to commend them to the reader. The bibliographical references should serve as starting points for any who desire to equip themselves with fuller information.

EVERYONE has in recent years heard a great deal about the meager results of our efforts to correct postural defects by prescribed exercises. Thus one hears stories of C grade postures becoming C— after four years of "correction," of the posture of school children growing progressively worse in the schools with up-to-date programs of physical education, etc., etc. Here and there some are evidently successful. But on the whole, it seems to me, the note is pessimistic.

I have no quarrel with those who say there is no relation between posture and health. Even though round shoulders and protruding chins do not predispose to lung trouble or what not, I would feel myself a bit more master of the situation if I could decisively alter such conditions. Since foot disorders are largely due to defective foot posture we must recognize that, at least in some areas, posture means more than looks.

I have re-examined in the light of recent developments in the physiology of the central nervous system, the principles on which my own conceptions of corrective gymnastics are built. Perhaps my speculations will help those who more intimately face these practical problems.

I think all are agreed that the position habitually assumed by any movable part of the body in relation to another part is due to the tonus of the muscles which hold this part. Sometimes it is the tone of one muscle group resisted by gravity, e. g., extensors of thigh and leg; sometimes the ultimate position of a part is the resultant of the tonus in opposing muscle groups and of gravity, e. g., the back and chest muscles in determining the set of the shoulder girdle.

To modify posture one must then increase or decrease this muscle tonus. As to principles of corrective gymnastics my own notions have been simply the following:

1. To shorten a muscle (i. e., increase its tone) it should be exercised. I think this idea came to me from Gulick's (1904 p. 11) statements, "the strength of this contraction (tonus) varies directly as the strength of the muscle," and "muscles and ligaments tend to assume the position during rest that they occupy during exercise."

2. To lengthen a muscle (decrease its tone) it should be stretched. I do not know the original source of this idea. It is in the writings of Bowen & McKenzie (1919 p. 21).

3. That mental states and good general health go a long way toward developing good posture. The idea of a mental burden or general weakness contributing to "slouch" was easy to accept.

Physiological Principles

Physiologists, notably Sherrington, Liddell, and Magnus have studied and measured muscle tonus in animals with and without cerebral hemispheres; after cutting the brain stem and cord at various levels; and after cutting nerves going to and from a muscle. Briefly their conclusions are as follows: First, muscle tonus is primarily a spinal reflex whose afferent element is the proprioceptive fiber arising from sense-endings within the muscle or the tendon of the muscle whose tonus is maintained by this reflex arc. Second, this tonus is reinforced and modified by special centers in the upper cervical region, the medulla, and midbrain, where afferent nerves from neck muscles, and the vestibular apparatus (internal ear) make connections. Thus turning the head and neck gives rise to a reflex redistribution of tonus, especially to the fore limbs, which puts the animal into a most favorable position muscularly to meet the emergency which greets the eye when the head is turned, let us say, to light or sound. In the medulla there is a center which when released from regulation of higher centers causes the animal to take on an exaggerated standing posture (decerebrate rigidity). Normally this extensor rigidity is checked by impulses from centers in the midbrain and cortex. These various reflexes are carefully reviewed by Evans (1930).

But to us a most interesting fact is that the sense-endings in muscle and tendon are stimulated by stretching. Sherrington found that when he pulled on a muscle it responded with marked shortening. This is called the "stretch reflex." It has also been shown that when a partially contracted muscle is stretched this stimulation is even greater and therefore more potently calls out further reflex shortening, or, if shortening is prohibited, then more tension or tonus. In fact, this seems to be the only tonus mechanism. All of the other centers merely regulate, redistribute or inhibit this tonus. The stretch reflex may be considered as the substance or cloth out of which the posture garment is fashioned. When I carried these facts back to my "principles of corrective gymnastics" I immediately questioned the value of stretching muscles to lengthen them. Perhaps if the muscle were first consciously relaxed (all tonus inhibited) a bit of stretching would be good for the connective tissue in the muscle. But the muscles which should be lengthened are the ones which are hypertonic and sometimes hard to relax completely. At best there is danger of stimulating the sense-endings and thus invoking the contraction of the "stretch reflex."

Next I wondered whether *contracting* of the overtoned muscle, let us say pectoral, was the cause of its

(Continued on page 48)

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High School Intramurals

By

ROBERT E. LINDWALL,

Intramural Director, Lincoln High School
Manitowoc, Wisconsin

THE university and college intramural director is beginning to realize that although the institutions of higher learning are the peaks of our so-called intramural pyramid, the high schools must be stimulated along intramural lines in the physical education program to complete the pyramid. The responsibility of the high school is largely confined to the building of the foundation for the superstructure which must of necessity be left to the university and college.

The Athletic Department of Lincoln High School has for its aim, "Intramural sports for every student," and carries on a completely organized program which attempts to bring every individual into some sport. The following are its specific objectives:

1. To provide facilities and the opportunity for individuals to participate in supervised sport activities 2-4 times weekly.
2. A natural division of competition (age-weight-size).
3. Opportunity for extra-mural activities.
4. Opportunity for competition with intramural teams of other near-by schools as an incentive, as well as the intra-school competition with talent of equal ability.

The program provides for twenty-five activities and thus allows every student to become interested in at least two or three sports.

The success of intramurals will depend upon the degree to which this department is able to unify itself with our physical education program and it seems significant that the growth of intramurals developed with our present trend of physical education, that is, away from the strictly formal type of activity. Before I explain briefly this amalgamation of departmental activity let me give you our intramural calendar.

September—Drop Kicking, Punting, Hiking, Touch Football, Cross Country, Life Saving Tests.
October—Touch Football, Hiking, Speedball, Cross Country, Life Saving Tests.
November—Swimming, Foul Throwing, Life Saving Tests.
December—Foul Throwing, Basketball, Wrestling, Water Polo, Life Saving Tests.
January—Ice Hockey, Basketball, Water Polo, Ice Carnival, Life Saving Tests.
February—Basketball, Boxing, Water Polo, Water Carnival.
March—Indoor Baseball, Swimming, Volley Ball, Life Saving Tests.
April—A.A.U. Tests, Sigma Delta Psi, Horseshoes, Track and Field Meet, Tennis, Life Saving Tests.
May—A.A.U. Tests, Sigma Delta Psi, Baseball (weather permitting), Horseshoes, Model Aeroplane Flying, Life Saving Tests.
June—Complete May Schedule.

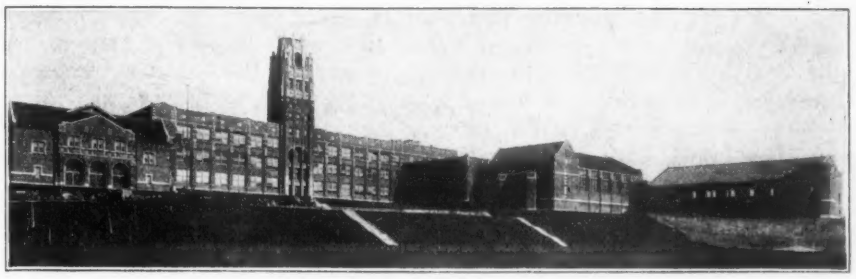
Note that the sports overlap from month to month, and that each specific sport is taught to the boys during physical education periods. For example, in September the technique of drop kicking and punting is taught to the boys just before the intramural contests in these activities. Hikes are taken during physical education periods stressing walking form and correct posture. The game of touch football is also taught in this month. In October the technique of speedball is added to the other activities. The rules for each game are also clearly presented along with the playing techniques. I do not mean to suggest that our physical education program is entirely of an intramural nature, stressing only sports, for in reality we use these activities only as an addition to our regular program. Thus it must be granted that the success of intramural activities rests upon the cooperation of the two departments and thus we may logically infer that the future will see the two divisions amalgamated, one supplementing the other.

A natural division of competition (age-weight-size) is an all important consideration. Thus one of the greatest problems facing intramural directors in the high school is a logical method by which teams may be formed so as to have a group loyalty and yet to be evenly matched. Here at Manitowoc we have experimented with various divisions, home rooms, gym class teams, club representation, and age, weight, height, class, singly and in combination, having been used. Of the techniques used in the past we have found the following one most successful. We call together all boys, for example, who wish to play speedball; then they are divided into age groups so that freshmen, sophomores, etc., are separated. These class groups are divided into weight groups; captains are chosen by the director, or nominated by men present so as to have as many captains as there are teams wanted. Captains then choose their teams by rotation and thus a fairly divided, balanced, and successful league is formed. The director goes on the assumption that no one knows a boy's ability like a boy and that he will choose individuals with ability, because every youth wants a winning team. It was realized of course that dividing boys into age groups (freshmen, etc.) was not a final basis of classification. In our experience (as verified by V. K. Brown of South Parks, Chicago) age correlates with performance with much more satisfactory results than height and weight, or any combination of the three factors. Our basis of division then is by assembling collateral facts, such as weight and height, and considering them as factors along with age. The height characteristic cannot be considered unless the number of participants is large, but height then becomes an important consideration. In sports where the interest is not so great we consider only the factor of weight. An example of this is found in boxing and wrestling.

Personnel of Department

The personnel of the department consists of a director, assistants from the physical education depart-

ment, academic faculty assistants, post graduate assistants, two student managers with assistants, and a student who writes up publicity material for the newspapers. The coaches, being members of the physical education department, also help in the intramural department when they are not coaching their sport. The faculty assistants are assigned certain activities which they supervise. The director organizes all the leagues, schedules, etc., but he delegates some of these duties to his managers.



LINCOLN HIGH SCHOOL, MANITOWOC, WISCONSIN

Two intramural managers are appointed each year from the intramural sports club. One shall be a senior in high school and be known as the senior manager; the other shall be a junior in high school and shall be known as the junior manager.

The senior manager shall be responsible for the care of all equipment used in contests. He shall also help in the organizing of the various teams, post schedules, keep scores of all contests played, and keep the permanent records up to date. Whenever necessary he shall assist in any administrative work the director assigns to him. At the close of the year he shall be awarded an official "M" with the manager's emblem attached.

The junior manager shall be responsible for notifying teams when they are scheduled to play, checking attendance of players, caring for teams after contest, assisting the senior manager with equipment and handling other detailed work that the director may assign. At the close of the school year, he shall be awarded a charm or emblem for his services in the department. Assistants shall be taken from the intramural sport club to assist managers when extra help is needed.

Intramural activities are divided into two types:

Interclass—where *at least* 4 teams (giving a great number opportunity to participate for the class) represent the class and the average of their teams' victories count as their status in the league. A silver cup is given to the class winning the most number of points in the 4 activities listed below. Winner—25 points. Runner-up—15 points.

1—interclass pushball (one team for this event)
2—interclass swimming
3—interclass basketball
4—interclass track.

Individual—There is an individual award and point system. The explanation of choosing teams for this division has already been given. This division is the most important of the two. The ten individuals scoring the most number of points during the year, as per the system, later explained, win a silver cup for their awards. A card index system records each participant's activities and points are assigned to him according to the point system. Sports are not divided into major sports or divisions. The reason for equal stress being placed on each sport is the fact that every sport has a definite value and that the sport which is a real activity to one boy may be drudgery to another. Extensive participation is the goal of the department and for that reason quite a bit of credit is given in points for just participating rather than winning. Thus a great many points may be accumulated by means of the participations alone. This was proved last year when three of the first ten men in high points were not even winners on teams or in tournaments. Participation paved the way for their high point score. To further stimulate participations, each student who takes part in five intramural sports is awarded a felt emblem for his efforts. In addition, gold medals are offered for completing the A.A.U. track tests and the modified Sigma Delta Psi requirements. Red Cross emblems are awarded for completing the junior or senior life saving tests.

The Point System

5 points—Sportsmanship and reliability (a student is automatically given 5 points and if he fails to report for a game or does not get an excuse from the director or Senior Manager 2 points are deducted for unreliability. If an individual is reported for unsportsmanlike conduct by the officials, assistants, or faculty he has 2 points deducted from his total).
2 points—For participation in any intramural event.
5 points—Being on a winning team.
3 points—Member on runner-up team.
5 points—Winner in single tournament.
4 points—Being runner-up in a single tournament.
3 points—3rd place in single tournament.
2 points—4th place in single tournament.
1 point—5th place winner in single tournament.
5 points—Completing A.A.U. tests.
6 points—Completing the athlete's test. (Modified Sigma Delta Psi).

Exceptions

Track—1 point—1st place in any event

Swimming—½ point—2nd place in any event—plus 2 participation points. ¼ point—3rd place in any event—plus participation points.

Hiking—½ point for 1st hike, each hike following first hike to be given ½ point more. Example: 2nd hike, 1 point; 3rd hike, 1½ points, etc.

Forfeits—Two points shall be deducted for forfeiting a single match, or for being a member of a forfeiting team.

Keeping Points

Our intramural handbook contains a score sheet where each boy may keep his own points and he may compare it with records in our department at any time.

Eligibility

Students who have been awarded the varsity "M" shall not be allowed to compete in intramurals in that particular sport.

There are no scholastic eligibility requirements for intramurals unless a teacher reports that a student's work is far below average and the student needs his

spare time for application on his studies. Any student attending high school, including post-graduates ("M" rule applying), is eligible to compete in any of the intramural sports during the year.

A player may not play on more than one team in the same sport during the season.

A player is not eligible to become a member of another team, even though his team has been eliminated from the tournament.

Any player may be ruled ineligible to compete in future contests for unsportsmanlike conduct, refusal to abide by decision of official, or for use of abusive or vulgar language. If such an occurrence does happen, officials are asked to report the irregularity to the director immediately.

Intramural Sports Club

The success of intramurals lies in the complete cooperation of not only faculty and administration, but also the student assistants. The Intramural Sports Club is composed of students who are intensely interested in this type of activity. The objectives of the sports club are as follows:

1—To sponsor, promote and conduct as many intramural sports as is consistent with the policies of the department of Physical Education.

2—To educate in methods of playing and officiating in the various sports.

3—To propagate sportsmanship and spirit of fair play in all interscholastic and intramural sports among players and spectators.

Officials are chosen from this club and these boys meet once a week with the director for practice officiating and for discussion of rules. This method of training officials is an efficient method of stimulating interest among a certain group of boys who desire to have leadership duties. The club is sponsoring an intramural news bulletin to be issued once a month as its first project. It is also offering a silver cup to the participator in the largest number of intramural sports.

Another problem that confronts the intramural program is the fact that the athletic facilities of the school are not always available for intramural use. The gymnasium presents a difficult situation due to the fact that the basketball coach must have it for varsity practice. The question arose as to the relative importance of using the entire gym for one team or for many teams. Our answer to the question may be read in our gym schedule. Our gym may be divided into two playing courts.

* Days	3:36	4:35	*
*	4:35	6:00	*
* Mon.	Int. ½		*
*	Var. ½	Varsity	*
* Tue.	Int.		*
*	whole	Varsity	*
*	floor		*
* Wed.	Int. ½		*
*	Var ½	Varsity	*
* Thu.	Int.		*
*	whole	Varsity	*
*	floor		*
* Fri.	Int.		*
*	whole	Varsity	*
*	floor		*

You may see from the above schedule that the varsity team gets on one-half the floor only twice a week immediately after school. Thus the choice periods after school are for intramural participations.

There are a few things that are important sidelights of our program and worth mentioning. Our annual faculty and senior intramural basketball game is a long-looked-forward-to event. The faculty also play the intramural championship girls basketball team in the spring. Features like this, besides giving the faculty opportunity for exercise and sociability, will stimulate your program. Your school annual should give considerable space to pictures of intramural sports. Our paper has a regular intramural sports corner. In addition to this, our intramural sports club is publishing an intramural sports news bulletin every month to be sold for a cent a copy. This is with the cooperation of the commercial department. Our hiking activities fit in nicely with the Boy Scout and Girl Scout programs and may be stimulated through those channels. Our life saving program also is in cooperation with boys' organizations. In regard to water polo we play a modified game and let the beginners who are not good swimmers play at the shallow end, thereby making two playing courts out of the pool at the same time. Our three carnivals during the year stir up a great deal of interest and we intersperse the events with special attractions. There are three carnivals: Indoor, Water and Ice. The mob idea of participation is used in these carnivals and 2 points are given for individual participation. Our local radio station cooperates in letting us have a regular intramural sports hour where we give the results—winner, teams, scores, etc. The local paper also runs an intramural column with the writeups of all activities. Every week we post the names of the ten highest men in total points as well as results of games played in various sports. Thus a lively interest is maintained. We continually ask boys how many points they have, and thus keep them reminded that participation is the goal of intramurals.

The Carnegie Report shows that medical supervision is very lax in intramurals. All our students are given physical examinations and we classify our students into groups. First, those who may participate in all sports; secondly, limited participations; lastly, no participations. This also expedites the matter of forming special physical education work. An important detail to watch in boxing is the use of large gloves. The use of at least a 14-oz. glove will eliminate injuries.

Our equipment and budget all come from the regular physical education fund. We also find that our admission fee to carnivals and special events furnishes us with enough money to carry on the program. However, we have a budget plan not dependent on sport or carnival receipts.

Toward the end of the school year we have our Annual Intramural Award Day where we present all the awards. The entire student body attends this function and we carry it on exactly as other award days are conducted.

(Concluded on page 49)

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"How WE Do It"

Round Robin Scheduling

I was very much interested in the article by E. Boyd Graves on making a Round Robin Schedule. The following scheme gives further and very simple suggestions along the same lines.

Where we have an even number of teams, all teams revolve around team number 1. (Names of teams can be substituted for numbers later.) With ten teams, for instance, we go down for half the teams and then up for the other half, team No. 1 remaining constant in the upper left hand corner. Here is the schedule:

1st day	2nd day	3rd day
1 — 10	1 — 9	1 — 8
2 — 9	10 — 8	9 — 7
3 — 8	2 — 7	10 — 6
4 — 7	3 — 6	2 — 5
5 — 6	4 — 5	3 — 4
4th day	**5th day**	**6th day**
1 — 7	1 — 6	1 — 5
8 — 6	7 — 5	6 — 4
9 — 5	8 — 4	7 — 3
10 — 4	9 — 3	8 — 2
2 — 3	10 — 2	9 — 10
7th day	**8th day**	**9th day**
1 — 4	1 — 3	1 — 2
5 — 3	4 — 2	3 — 10
6 — 2	5 — 10	4 — 9
7 — 10	6 — 9	5 — 8
8 — 9	7 — 8	6 — 7

In workng with many boys' teams, I find they can follow a schedule which is written vertically much more easily than one which is written horizontally. For this reason I prefer to write one schedule for each game but Mr. Graves' scheme of using the same schedule for five different games can be followed.

It very frequently happens that a league may be composed of an odd number of teams. As Mr. Graves did not offer a suggestion for making a schedule quickly from an odd number of teams, I will offer the one I use.

As stated in the schedule with an even number of teams, all teams rotate around team No. 1 which remains in the upper left hand corner. With an odd number of teams, 11 for instance, all teams rotate so that the last team in the column on the left draws a bye. Here is the schedule:

1st day	2nd day	3rd day
1 — 11	11 — 10	10 — 9
2 — 10	1 — 9	11 — 8
3 — 9	2 — 8	1 — 7
4 — 8	3 — 7	2 — 6
5 — 7	4 — 6	3 — 5
6 — ..	5 — ..	4 — ..
4th day	**5th day**	**6th day**
9 — 8	8 — 7	7 — 6
10 — 7	9 — 6	8 — 5
11 — 6	10 — 5	9 — 4
1 — 5	11 — 4	10 — 3
2 — 4	1 — 3	11 — 2
3 — ..	2 — ..	1 — ..
7th day	**8th day**	**9th day**
6 — 5	5 — 4	4 — 3
7 — 4	6 — 3	5 — 2
8 — 3	7 — 2	6 — 1
9 — 2	8 — 1	7 — 11
10 — 1	9 — 11	8 — 10
11 — ..	10 — ..	9 — ..

10th day —	11th day
3 — 2	2 — 1
4 — 1	3 — 11
5 — 11	4 — 10
6 — 10	5 — 9
7 — 9	6 — 8
8 — ..	7 — ..

By substituting names of teams for the numbers we have a complete schedule.

It should be noted that the scheme for either an odd or even number of teams can be used for any number of teams from four up, the principle involved being the same.

Julius Kuhnert,
Supervisor of Physical Education,
Mount Vernon, N. Y.

Physiology — Tonus Reflexes

(Continued from page 42)

tonus or whether perhaps it was the *stretching* of muscle and tendon by the load which the muscle carried or the stretching effect of being suddenly stopped as when a blow is landed, that induced the hypertonicity. If I knew which it was I would know what to emphasize in trying to put more tonus in the weak muscles of the back. Certainly the next time I try to correct posture I am going to forget about stretching the "strong" muscles and I'm going to try in some way to stretch the ones I want to strengthen *after* I've got them at least partially contracted. In some way I shall try to resist the contraction of the muscle whose tone should be increased but I'm going to be mighty sure that this resistance is not in the form of stretching of the opposing muscle which is already hypertonic and needs no encouragement by further stretching. Bowen and McKenzie say ". . . correction of posture is secured by improving the tone of one muscle and stretching its antagonist by the same exercise." This seems unsound to me.

The fact that all impulses from the cortex as well as most pain stimuli lead to the reflex reduction of tonus gives me a bit of scientific foundation for my third principle and explains why sorrow, worry and cares, all of cerebral origin, ruin posture.

Of the reflexes which result in redistribution of tonus one interests me in this connection. If the head is thrown backward there is increase of extensor tone in the fore limbs and reduction in the hind limbs (this from the decerebrated cat). When the head is thrown downward and forward the tonus in the shoulders and fore limbs lessens while it increases in the hind limbs. Children because of their size must always look up at things and people. As they grow taller there is more and more that they can look down at. Isn't this at least a possible explanation why children may develop progressively "poorer and poorer posture" the longer they are (better now the *longer* they *become*) under the direction of their physical education teachers?

I have criticized my own beliefs about principles of posture correction. I know some others who hold the same views. There may be many who already practice on sounder principles. Because I hope that some

will take time to think this thing through and better still, try it out, I have put it on paper. I would like to hear from any who have light.

SOME PERTINENT LITERATURE

Bowen, W. P., and R. Tait McKenzie, "Applied Anatomy and Kinesiology." Lea & Febiger, 2nd Ed., 1919, p. 21.
Evans, C. Lovatt, "Recent Advances in Physiology." Blakiston's Sons & Co., 4th Ed., 1930, Chap. XI.
Gulick, Luther H., "Physical Education by Muscular Exercise." Blakiston's Sons & Co., 1904, p. 11.
Sherrington, C. S., "The Integrative Action of the Nervous System." New Haven & London, 1920.
Spiegel, E. A., "Der Tonus der Skelettmusculature." Julius Springer, Berlin, 1927.

Answers to Questions

Editor's Note:—Dr. Steinhaus has agreed to discuss problems that may be raised by readers of his series of articles on the Physiology of Exercise. The following explanation is the result of a question that has been brought to his attention.

Question: Is nausea produced from overexertion in exercise the same as from exercising in the hot sun?

Answer: I am not sure that I can answer this satisfactorily. As I stated in an earlier article, excessive heat as well as overexertion tends to inhibit stomach motility. Nausea may result from the irritation of food or secretions in the atonic stomach. This would suggest a common etiological factor in the two conditions. But hot sun undoubtedly introduces additional factors such as glare, which is believed to cause nausea through nervous reflex effects on the stomach.

High School Intramurals

(Concluded from page 46)

Extra-mural activities are worked in wherever possible. A certain period is put aside each week in the pool for the practice of life saving.

The high school skating rink is at the disposal of all the students all winter. When the hockey rink is not in use for scheduled games it is usually occupied by a group of boys. During the fall and spring the tennis courts are open to all at certain periods. Horseshoe courts are available all fall and spring for practice. Before the dropkicking and punting contests, balls are available for practice after school. The ante-rooms off the gym are continually being used for tumbling, apparatus, wrestling and boxing, besides the regular scheduled activities in these events.

Intramurals have a tremendous value, and influence the student to a considerable extent. The fellowship and recreational values, skills, and the promotion of health-giving qualities are but a part of the total contribution to the student. Outstanding is the spirit of sportsmanship and cooperation in competitive effort which is developed.

To get youth to respect the rules and to show them that winning is just a small part—that is the real value of intramurals.

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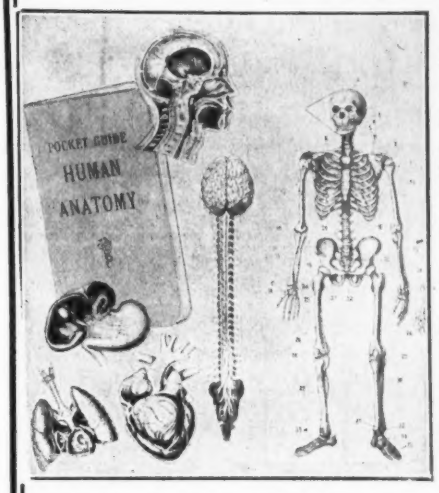

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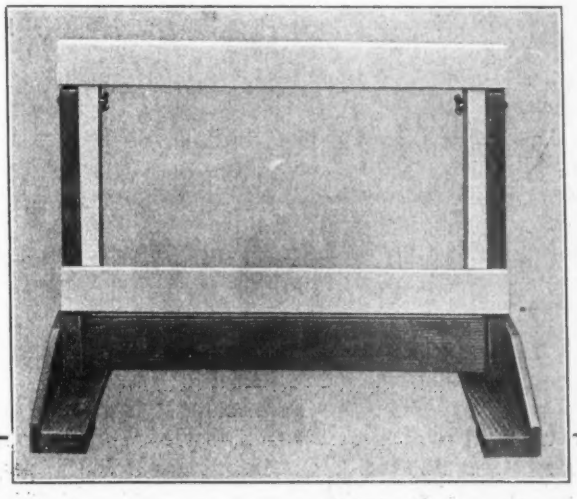

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Corrective Physical Education

(Concluded from page 25)

appearance are practical and legitimate means of motivation. Caution must be given in this point in working with many students. Outwardly they show very little interest in personal appearance and seem to have no pride. Underneath the surface, however, there is, no doubt, at least a germ of feeling for personal appearance and while this appeal may not be successful at first, if properly followed, favorable reaction generally results.

The attitude of the opposite sex is one of the strongest and most deep seated factors. Show a lad the posture silhouette of four girls and ask him which of these he admires most or would choose preferably for a wife and nine out of ten will pick out the "A" or "B" posture.

10. Use of rhythmical activities, dancing studies, interpretation in music, dramatics, pantomine.

Use of the piano, victrola, and all types of music are of tremendous force in stimulating boys and girls in corrective classes. The activities should, of course, be adapted. Strenuous jumping and leaping should be eliminated. Emphasis should be made at all times upon correct foot positions.

Social dancing has its value because of interest and "carry-over." Simple clog, tap dancing and other rhythmical dancing activities have an important place in the corrective program because of the elements of skill and agility necessary in the performance. It must be emphasized, however, that the simple dances should be used at first so that the student is quickly made to feel that he can accomplish something. Too often the teacher of dancing "pushes" her class too rapidly and fails to allow sufficient time for practice after one has mastered the dance. With corrective groups especially it should be emphasized that the dance is the medium for developing certain characteristics and the emphasis should not be placed on numbers of dances learned.

11. Use of Apparatus.

Carefully selected exercises on stall bars, horizontal bars, tilted balanced board, correct use of chest weights are recommended. (See Restricted High School and Elementary Schedules, Lowman, Colestock and Cooper, "Corrective Physical Education for Groups," pages 314-353, 243-291, published by A. S. Barnes Company, New York; also Stafford's "Preventive and Corrective Physical Education," p. 134, published by A. S. Barnes Company.)

Use of apparatus has certain drawbacks when it is carried to the extreme. Physical education should train for activities which are used outside of the school. It is obvious, therefore, that continually exercising with apparatus makes the individual "apparatus conscious" and fails in its educational value.

12. Frequent Change of Method.

Frequent change of method in teaching is recommended for stimulating interest in corrective classes.

a. Use of apparatus as a change in the program when apparatus is rarely used.

b. Use of regular weekly and daily program progressively outlined for each student.

c. Change of periods that are designated as exercise periods to recreational periods and vice versa.

d. Change in methods of presentation of exercises and games; student leaders in charge, teachers leading groups, working without leader, etc.

e. Devotion of part of period or even whole periods for general discussion and study of such things as the posture manikin, pertinent health suggestions, etc.

f. Students devise and create and present corrective stunts. Discussion and application by teacher and class.

13. Use of posture week, postures, contests, plays, etc.

14. Noting improvement in general health, posture, etc., after one or two months work.

The above outline is a composite of the motivation used by various workers in correctives throughout the country. One will note a marked tendency to get away from the strictly formal type of work where the teacher realized that the student was in class for a certain number of meetings and regardless of whether he liked the work, he had to perform certain activities. The newer idea is that we recognize the school as a laboratory for the learning of better living and the work which is done during the class period should be interesting enough so that the student will want to perform the same activities after his school hours are over.

(To be Continued)

Gymnastic Aims

(Continued from page 9)

will have to use an additional amount of energy to correct its faults in another one-sided game. The second game will not be efficient owing to fatigue. That is why, for instance, one cannot refresh himself in periods of hard brain effort, by indulging in strenuous sport. You should train with the idea at all times of developing the unity of *all* powers with the least expenditure of energy.

We believe that once in history such a state of harmony was reached—in ancient Greece. We know that the life of sport with the Greeks was intimately connected with their education in knowledge. We also think the combination of five exercises in their pentathlon was a happy one. Today, however, life demands much more of man than it did in ancient Greece. Our knowledge in all lines of thought must be much more extended than ever before. Games alone in this modern era of specialization are not sufficient to develop a harmonious whole even were time allowed for many types. We must look for something more concentrated.

The gymnastic teachers of today find an answer in natural gymnastic movements. How do we do gymnastic movements in order to gain concentrated benefits from natural movement? We define natural movements as direct functional answers to a given problem. These movements we call purposive. We must find the laws for these purposive movements. We must open our eyes to the language of every day movements, try to find out what is happening when we chop wood,

climb mountains, or walk and run. In short what forces us to move and work? In such natural movements, fundamental laws of our muscle-nerve-apparatus find expression. We must study the forms and functions of man, consider how they depend upon each other, test to find the underlying, common cause of the innumerable movements we see all around us, and try to discover the reasons for differences and deviations.

Once understood, we must submit to these laws in gymnastics if we agree that the value and effect of gymnastic exercises should be perceptible beyond the walls of the gymnasium and if we hope that those doing these exercises will be more capable and better equipped for life than those who do not do them.

First of all we must have movement—many, many movements—the privilege of living beings—if we are to influence the posture and movements of everyday life. For this reason we are obliged to abandon the Swedish form of free-standing exercises with their stiff abrupt bursts of movement and their long, strained pauses. They are tedious because of the lack of purpose. This form of movement has no connection with our normal, functional movements. We do not move by counts or react only to commands. Our prerogative is to act of our own free will. We do not move part by part in right angles and in the three logical dimensions. That is, on the contrary, the way of moving of a mechanical doll. Even a modern locomotive is far more human in its functioning than a Swedish gymnast. Let us be careful in our eagernesses to remember that we are educating human beings, not machines. Think of the innumerable combinations of arm movements that occur in everyday life. Such artificial movements as arm-stretching forward, outward, upward, can never impart grace to movement or mobility or fitness. Nor will deep-knee-bending develop a more graceful or economical walk. Those who practice gymnastics should not first lay aside their human attributes in order to become more human.

The exercises must in themselves be an enhanced expression of natural rhythm and natural forms of energy. Only then will they be of any educational value. All the exercises, even the easiest, must be based upon certain functional combinations, rather than upon logically conceived elements of movement supplied with machine-like acrobatics upon apparatus. Perhaps you will say that I am inconsistent in this attitude on apparatus stunts, because previously in this article I have emphasized the benefits of the purposive movements in sports, and you will contend that these gymnastic exercises have similar purposes and effects. It is true that acrobatics in their perfection have this to recommend them, namely, that every movement corresponds exactly to the purpose in view. But, as I have also said, the time permitted for exercise compels us to concentrate and think of the time it takes to acquire perfection in these special dexterities—if we ever acquire it. During a short lesson, minutes must be spared and not devoted to the moving of apparatus or to the "one at a time" performance. Moreover, the restricted character of the purpose itself removes such skilled movements from

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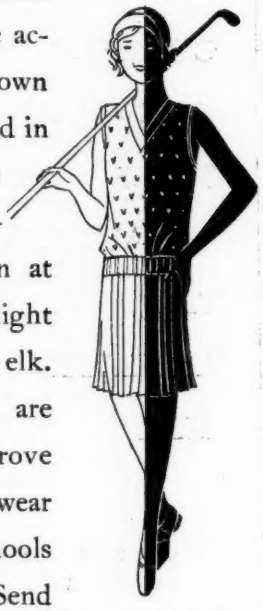

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the sphere of ordinary human action, and thus cannot be said to educate in the all around meaning of the word.

Next I am convinced that the movements depending on the systematic arrangement of the human body itself and consequently agreeing with its functions should be sufficient, if well understood, in our aim of further cultivation of the human entity. Gymnastics ought to be interpreted as inclusive of the training of the body even in isolation.

As we study human movements, we must admit that the most common function of all is walking, or as we should say the walking movement. It is the type of human movement from which all other movements may be derived. This includes not only the movements of the legs but those of the trunk, arms and head as well. It is true that all the possibilities of bodily movement are present in walking and what is more interesting, present in the functional proportions. And within this law of relation lies hidden the test that makes movements beautiful, graceful, and appropriate even when concerned with movements other than walking. By clinging to this principle of the proportional relationship of movement it is possible to combine the functional elements of movement into more complex exercises.

What we must do in the first place is to make an analysis of the complex method of walking in order to create a "functional system" and consequently a real pedagogy, so that we may obtain a scale of difficulty whereby progress can be actually observed. According to this method, the free-standing exercises which are arranged to fit different parts of the body and logically divided will never prepare for the complex movements of everyday life. You will often see excellent Swedish gymnasts fail in skill and endurance in some other form of sport. It is because it is impossible to go from logic to function, to achieve a useful effect. A broad-standing knee-bending will not prepare for horseback riding. Or if you walk, as is often to be seen in Germany, with feet inward for two steps, then feet outward for two steps, you will not achieve a better walk. You will merely exercise a new function—but is this function normal or necessary?

Let us take a parallel from the art of dancing. You will not be a more impressive dancer if you train in such positions as fingertips on the chin or your hand on your heart. That style is just the shell of dancing as are the logical exercises in gymnastics, of which we have already made mention.

The one lacks feeling; the other lacks function. The natural principle also makes it possible to produce continuous movements—in gymnastic language, a series of exercises—in order to build the whole lesson up into a systematic, artistic whole, in which the pauses as contrasted to the Swedish system are living parts, either valleys in the billowy, rhythmical flow of work or real stops but still organic parts of the work. That is why it is possible to accompany these movements with music which does not detract from the lawful function of the work.

The Classroom Teacher

(Continued from page 29)

ence might have been reached and physical education would have followed as a natural sequence. The social science unit could have been articulated easily with the physical education period, for the unit at hand was the study of the life of the early Dutch settlers of Manhattan Island. What more suitable activity for a physical education period than to play the games played on "Bowling Green"?

It is possible for the special teacher, if she is interested in fields other than her own, to coordinate physical education with other units of work in the school. She might coordinate her work but not integrate it, for "coordination puts emphasis upon the parts united; integration upon the whole which results from the integration of the parts."*

With the special teacher, the periods are distributed throughout the entire day. With the classroom teacher the period can be given at the most beneficial and psychological time. Furthermore since the elementary school period is shorter, the special teacher comes in contact with so *many* groups of children that it is almost an impossibility for her to become acquainted with the individual needs and abilities. And again, if the special teacher should be the type who is desirous of coordinating her work with the school activities which are being carried on at the moment, her task becomes prodigious as she attempts to adjust to the various and varied units of work which she confronts every 20 to 30 minutes throughout the day.

Integrated school activities place emphasis upon generalization. Throughout the elementary school there are many possibilities for generalizing experience and yet these possibilities all too often are turned into narrow specialization. There is nothing more formal than a subject which revolves about itself. One reason why physical education has been considered a special subject is because some physical educators insist upon its revolving about itself and insist that it be taught by specialists, who usually have very little interest in the rest of the program.

Since the same principles of teaching apply to all activities and units of work, the idea of "special teaching principles for physical education" is fallacious. It is true that there are specific teaching techniques for the varying kinds of content in physical education activities, but they are subordinate to the general principles of all teaching. The elementary school teacher has been trained in these general principles of teaching and there is every reason why she could be sufficiently trained in the specific techniques of physical education and be made familiar with the content of physical education activities.

The responsibility for this training rests with those teacher training institutions preparing elementary school teachers. Physical education in teacher training institutions is being made an integral part of the life

* Burnham, W. H., "The Normal Mind." D. Appleton & Co., New York, 1924. Pg. 34.

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of the school; the "intending teacher" is experiencing physical education as a way of living. Progressive teacher training schools are now giving many opportunities for rich experience in physical activities.

The training of the special teacher is of such a nature that her performance in motor skills may be of a higher quality. This is the one point which can be made in favor of special teachers for elementary schools. However this sole factor loses its significance when compared to the many other demands and duties made upon and expected of every teacher in the modern elementary school with its integrated activities. Most of these demands and duties are related to integration and cannot be fairly asked of the special teacher.

Summary: The modern school is concerned with the whole child. It strives for unified living by means of integrated activities. Physical education should form a part of this unified living by being taught as an integrated activity. Integration of physical education depends upon the classroom teacher because: (1) there are many opportunities throughout the day to teach physical education, and therefore, it should not be confined to a single period, at a definite time; (2) the classroom teacher has a keener understanding of each individual child's needs and interests; (3) the opportunities for generalization are more numerous and unified; (4) the classroom teacher is the guide in the choice of units of work to be studied by the children; (5) there are more opportunities for the inter-articulation of activities; (6) the classroom teacher can choose the most beneficial time for the period; (7) the classroom is cognizant of the kinds of activity needed.

Integrating Physical Education

(Continued from page 4)

tivities, and a wider repertoire of interests. We need physical activities adapted to students of all types of motor quotients.

Thirdly, the place of physical education directors on the social committee of the school is obvious, and here the table turns. The place of the social chairman in the health administration is equally obvious. I know of more than one institution where persons in charge of large student activity programs are never once brought into conference with the health administration!

Fourthly, relaxation is to me one of the greatest problems of modern life. Its relation to physical education may be disputed. But the need for its teaching is too obvious to be stressed here. It seems to me infinitely more important that a shop girl and a mother be taught to relax than that a debutante be taught to hurdle. Whether or not physical educators wish to include relaxation in their program, the rest of the educational world expect them to do so.

In the fifth place, physical educators should assume their responsibility in the cultural development of the school community. You may well expect the Y.W.C.A. and the Y.M.C.A. to bring to your campus such per-

sons as Sherwood Eddy. You expect the debating society to bring the Oxford debaters and the glee club to sponsor St. Olaf's Choir. Why can you not make a similar contribution from cultured persons in your field?

There is one point where physical education might make a compromise which would bring in an uncompromised result. In most physical educational courses, there is some emphasis on posture and walking. Students generally improve their postures and walking in low heels. But girls do not always wear low heels! When they wear their high heels, there seems to be no transfer of training. At Stephens College we found that the girls wore low heel sport shoes altogether on the campus. One dealer alone sold to our 600 girls 1800 pair of low heel shoes in the course of a year and mailed the same type of shoes all over the United States to former graduates. When we watched our girls in evening dress, we saw that they had not carried over at all the good posture we thought they had developed in their sport shoes. Miss Haynes then began two weeks' attention to posture in physical education classes. The girls were instructed to bring their high heel shoes to class. They didn't get into the spirit of the experiment. They were instructed to bring their evening dresses. In formal costume, they practiced standing, sitting on low davenports, and dining room chairs. The girls were interested and the experiment seems to have been of some benefit. Immediately, critics will say, "That is not physical education." We would say, "It is not vigorous activity but it is socially wholesome and mentally speculative, at least to an adolescent girl. It may not be entirely physically wholesome but it gives an opportunity to show the girls what's wrong with high heeled shoes. In the end it will probably bring more converts to lower heels than any tirade."

We are differentiated by inheritance, by thinking and by experience. If our education is actually to develop the whole personality and to train for a peaceful civilization, we must attempt to integrate our differences as best we can. The integration of differences will have to come by thinking and by experience. Biologically, we develop from the small to the large. Similarly, psychologically, society develops from the unit to the whole. If education is to keep apace with this era, it must integrate the individualistic and the socialistic. In every phase of education we must attempt to show the student the organic whole of society. Massing as we do the thousands of students of one age in educational institutions, we give them a false notion of the organic society. They see it in layers, as a cake. And they generally conclude that they are the icing. Rather, we should show that the organic society is vertical, as a tree. Each, teaching in his special field, must not be so interested in his own subject, as in the development of the relation of his subject to the whole of life.

Physical education integrated into the whole life process can help to develop the group consciousness of the student and make him more aware of the creative spirit in life. It is as if the whole of life in this new creative age were saying to us "Where two or three are gathered together in my name, there I am also."

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IT MAY INTEREST YOU TO KNOW

DR. A. H Steinhaus, professor of physiology and director of the Y.M.C.A. College Laboratory for Physiologic Research in Physical Education, Chicago, has been honored recently with a Guggenheim Fellowship. This award will permit him to spend a year abroad in the study of physiology. Dr. Steinhaus plans to go first to the Kaiser Wilhelm Institute at Dortmund, where he will study the physiology of work and exercise—"arbeits-physiologie"—with Professor Atzler. Later he will visit other laboratories on the continent. He will leave for Germany in September. Many readers will immediately identify Dr. Steinhaus as the author of the column, "Physiology at the Service of Physical Education," which appears as a regular feature of HEALTH AND PHYSICAL EDUCATION.

AN announcement of forthcoming publications of the Office of Education, Department of the Interior, Washington, D. C., lists among them, "Hygiene and Physical Education" (Bulletin 1931 No. 20, Chapter X) by Marie M. Ready, associate specialist in recreation, and Dr. J. F. Rogers, consultant in hygiene and specialist in health education, both of the Office of Education. This work reports facilities and practices in public school medical and dental work, health and physical education, athletics, research in play, community use of school property, and other information of a similar nature.

THE tenth Olympic Games, greatest of all sport carnivals ever held in the United States, will be celebrated at Los Angeles in 1932 beginning Saturday, July 30 and ending Sunday, August 14. The third Olympic Winter Games will be held at Lake Placid beginning Thursday, February 4 and ending Saturday, February 13.

The following program of events will be contested at the Games of the tenth Olympiad: Track and Field, Gymnastics, Boxing, Wrestling, Fencing, Swimming, Rowing, Equestrian, Road Cycling, Weight-Lifting, Yachting, Shooting, Polo, Water Polo and Field Hockey.

MURPHY High School of Mobile, Ala., has just dedicated its new physical education unit. This unit is most unusual. The Board of School Commissioners, realizing the imperative need of a modern physical education plant, put aside the plan for a conventional gymnasium and sought and obtained what it believes to be the most modern outlay for a complete physical training plant for a school of 2,500 pupils. The building contains the following: boy's gymnasium, girl's gymnasium, corrective gymnasium, varsity room, visual education room, ample provision adjoining all rooms for offices for instructors and coaches, lockers and showers; a swimming pool 25 by 75 feet; a Health Suite with adequate facilities for use of the school doctor, dentist, and nurses. The Board has appropriately dedicated this unit and athletic field to the health and physical development of the boys and girls of Mobile County. An attractive dedication booklet, giving photographs and plans of this physical education unit, has been issued.

THE Clinton, Iowa, High School has solved many vexing athletic problems by installing a new system of athletic awards. In this new system the stars don't get all the honors; it is possible for the "dub" to "make" his letter. Points now govern the award of athletic honors instead of participation in inter-school games. Many coaches of the state might well take various items in the Clinton plan under consideration for their respective institutions. If you are interested you might get in touch with the Clinton authorities for a detailed explanation of their plan.

IN accordance with the plan of Mr. C. M. Miles, State Supervisor of Physical and Health Education for Florida, to have the physical and health education directors of each large city organize for the purpose of better promoting the work in their respective cities and in unifying the state program, all the directors of the Tampa schools, numbering 32, held an organization meeting recently in the nature of a banquet. They elected officers for the Tampa Council of Physical and Health Education Directors. Those elected were: David B. Wright, president; Miss Frankye Bufkin, vice-president; and Mrs. Julia Lane, secretary-treasurer. Mr. Wright is also president of the Florida Physical and Health Education Directors Association.

It is the plan of the council to hold bi-weekly meetings at various schools at which time speakers and discussions pertaining to the work will be had. Physical education work has made great improvement in Florida and in Tampa particularly in the last year.

Canoeing Instruction

(Continued from page 14)

they knew about paddling, struggling without results this same way. When you go against the wind, it is better to have the canoe a little down by the bow; the part above the waterline acts like a weathervane and the tendency is for the canoe to point towards the wind. If it is very rough and there is a tendency to take water in over the bow, you just can't do it and have to take your punishment.

At the camps where I have been—a boys' camp on one side of a lake and a girls' camp on the other—the camper, to pass the canoe test, has to paddle out to a buoy, paddling out on one side and back on the other without changing sides. Next we have the camper paddle out and back standing; likewise out and back standing on the gunwales with the same rules applying. Then he has to dive out of the canoe and get back in over the side without upsetting the canoe or filling it.

There is a general impression that one should get into a canoe over the bow but this is wrong. This is very difficult to do in smooth water and practically impossible in rough water. As the last and by all odds the most difficult test, as it takes real watermanship, we ask the camper to paddle a quarter of a mile to windward against a stiff breeze with slow strokes and allow him to change sides only twice. This is a very good index of just what he can do.

A few other pointers may be of value. In standing and paddling on the left side, the right foot is in advance and on the right of the median line with the toe just touching the keel or mid line and the left foot is on the left of the median line with the heel touching the keel—the body in a diagonal position of about forty-five degrees. Here the paddler can reach farther forward for his stroke and can carry the shaft of his paddle more nearly perpendicular with the side of the canoe.

Paddling in different positions is very restful on an all day trip. When a person wishes to change sides he calls "change," and at the finish of that stroke as the blade is scaling out and forwards he gives an extra squeeze down on the hand on the end of the paddle shooting the paddle out of the water up into the air and ahead. As it comes down he changes hands and drops it into the water in rhythm with the last stroke, no stroke being lost. It is needless to say that when two are paddling they should keep stroke with each other, the bow paddler setting the stroke.

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od of paddling. On one Canadian trip that I took with my wife who weighs one hundred ten pounds we were overtaken by two Forest Rangers on a portage and after we had arranged about fishing licenses and made inquiries about a portage, the rangers said good-bye and started off on their long paddle to their station. It was then about nine o'clock in the morning. I wanted, however, to stay with them until they stopped for lunch as I had a number of questions that I wanted to ask concerning certain lakes. I might add that my canoe was much heavier loaded than theirs as this was the second day of a three weeks trip and all our provisions were in it. About one o'clock I called to them and asked them if they ever ate; they said "Yes, at headquarters at about two-thirty." When they swung off for headquarters at a little after two they pointed the portage to me. They were somewhat surprised that we stayed with them and the Chief Ranger joked the man in the bow of his canoe, a six foot husky Canadian, about not holding up his side of the canoe saying, "Of course I don't expect you to be in the same class with *his* partner."

In this test, the rangers paddled three strokes to our two and the only instruction that I gave to my partner was to say occasionally, "Don't pull." The wind was pretty high and there is always a little tendency to dig in. The paddling done by the Rangers and Indians (with the exception of the Algonquins, whose paddling I naturally admire very much) is a shorter stroke; and the paddle is not carried so far forward and is dug in quicker with a sort of quick push or yank at the end of the stroke. It is a good method to rest on but if one is accustomed to the other way it is seldom necessary to change.

A word about safety. With one person sitting in the bottom of the canoe and one on the thwarts, a canoe with an average paddler is fairly safe; but with two persons sitting up, especially in rough water, it is unsafe. The difference between a boat and a canoe is about the difference in safety between driving a spirited horse or a nag. When a canoe is topheavy, it is about the quickest thing that I know of to move out from under you; but when loaded with the weight in the bottom, it is as steady as the average boat. When upset, stick to the canoe; it can float several people. We teach each camper to upset a canoe, to crawl into it rightside up, and to slide his legs under the middle thwart and sit up and paddle. He can go this way about as fast as an old fashioned swimmer can swim. If two get upset, one can paddle the canoe this fashion for a time while the other boy swims and turn about; or one boy can hang on. In teaching this safety plan, there will be several upsets, especially in rough water, but the boys can crawl back in the canoe and try it over again.

In carrying canoes, some use yokes and some carry them on the head with a pad between the head and canoe. The Indians usually carry with a pad. With the latter method you can hold the canoe steadier if you have to make a little jump from one rock to another or across a little gap in a ledge.

Organic Development

(Concluded from page 11)

ercise not only increases the functional capacity of muscle and the vital functions of the blood but likewise produces beneficial results in the whole nutritive and digestive processes and also in the respiratory, circulatory and heat regulatory mechanisms of the body. There is, however, much evidence for such statements.

I should like to leave with you this final thought. Were you given a child of four or five years, in perfect health; and were you through the marvelous medical and surgical skill at your command in this modern world able to immunize him against every known disease, to feed him the most perfectly balanced diet, to remove every focus of infection; and yet, were you to deny him the opportunity for activity, for play, for free and joyous movement, it would require more skill than is available in the modern world today to keep that child's body from a slow decay and atrophy. If through some miracle, he grew to manhood, he would be puny, stupid, malnourished and indolent. The spark of life, the essence of personality, the thrilling urge to do something and be somebody would have been killed. For in activity, we find the *sine qua non* of a sound and normal growth and development.

The Special Teacher

(Continued from page 28)

child in his free moments is necessary. The discipline of the playground is as important as that of the school room if the needs of the group and the individual child are to be considered, but it is of a different type and needs to be guided accordingly.

The classroom teacher would undoubtedly profit from regular outside activity with her group, but one should also bear in mind that the nervous tension and fatigue resulting from the teaching of elementary school children can be best relieved by intervals of relaxation away from the group of children. The periods when the classroom teacher is relieved from her group offers opportunities for her to prepare materials for the next lesson, to help the child who may need special work, to hold conferences and to meet her group upon their return in a freshened state of mind. It is as important for the classroom teacher to cooperate with the special teacher of physical education as it is for the special teacher to cooperate with her. For that reason she should plan to take part in their play activities as often as possible. She should have some periods when she may play with them and the physical education teacher can arrange that this be done.

One may argue that under ideal conditions an excellent classroom teacher in an elementary school can do all the things which the special teacher of physical education can do and that the special teacher of physical education must excel to carry on a program such as has been discussed. There are certainly two sides to the question, but if physical education is truly to be

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considered as education and a recognized tangible force within the school which is instructing in habits, attitudes and skills to serve present and future needs, then it must be as carefully planned, directed and tested as are all the other activities of a child. In the final analysis it is the teacher with enthusiasm, interest, knowledge and personality who furnishes the guides for a child in the process of learning. The demands upon the classroom teacher today are so great that she cannot possibly do justice to all the subjects she must teach, no matter how conscientious and willing she may be in assuming these responsibilities.

A special teacher of physical education through her understanding of the problems in education can, through wise and intelligent leadership and cooperation, make her place in an elementary school essential.

A Health Project

(Continued from page 41)

42. If your hands look clean you don't need to wash them after using the toilet. T F
43. The best way to prevent constipation is to take castor oil once a week. T F
44. Playing out of doors every day, eating fruits and vegetables, drinking plenty of water and sleeping long hours keep you from being constipated. T F
45. Reading the baseball news in the newspaper, going to a great many baseball games and movies of sporting events will be more likely to help a boy be a good athlete than sleeping long hours at night, eating regularly and playing out of doors every day. T F
46. The correct way to stand is with the heels together and the toes far apart. T F
47. If you do not use your muscles they will get soft and flabby. T F
48. There is much lime in bones. T F
49. Playing out of doors in the sunshine helps boys and girls to grow strong, and helps to prevent some diseases. T F
50. When you are sitting at your desk studying, your feet should be flat on the floor, the lower part of your back should be against the back of your seat. T F
51. When there is a gymnasium at school, it is better to play there after school every day if the principal will let you than out of doors on the playground. T F
52. It is good for children to jump rope, run races, or play ball even when very tired, because these are good exercises. T F
53. A soft tooth brush that is kept wet all the time is the best kind to use. T F
54. Some people have poor teeth because they do not eat the right kind of food. T F
55. The most important reason for brushing the teeth is that they look better when they are brushed. T F
56. Milk is a good food to use to help make good teeth. T F
57. Boys and girls should not chew coarse foods such as whole wheat bread, dry crusts or toast because they may scratch the teeth. T F
58. When food sticks in between the teeth, bacteria grow there very easily. T F
59. Chewing tough food gives the gums of the teeth exercise that is good for them. T F
60. Bacteria grow more quickly in a wet place than in a dry place. (Such as a wet or dry tooth brush.) T F
61. If your hands look clean it is all right not to wash them before dinner. T F
62. If you use the towel of someone who has sores on his face and hands you may get sores on your own face and hands. T F

63. It helps your digestion to take a hot bath right after a meal. T F
64. Taking a hot bath draws the blood nearer to the surface of the body. T F
65. One reason why you should keep your hands away from your face is that there may be disease germs on your fingers. T F
66. It is all right to wipe your face on a towel that has been used by other people in a public wash room if the towel looks clean. T F
67. When you are reading at night you should sit so that the light is in front of you and shines right on your book. T F
68. One reason why some people have headaches is that they spend a good deal of time reading fine print in a room that is not very light. T F
69. If comfortable, it is all right to read lying down. T F
70. If your eyes hurt very often, you should go to see an oculist even if it costs some money. T F
71. If you have a running ear, the thing to do is not to bother anyone about it unless it is very bad. T F
72. An earache which is not severe needs the attention of a doctor. T F
73. If you have a slightly sore throat or your nose is slightly stopped up it is better to tell your parents, the teacher or the nurse at once than to be brave and keep it to yourself. T F
74. It is all right to lend the handkerchief you have used to your friend if he has lost his. T F
75. The best way to blow the nose is to close first one nostril and then the other and to blow gently. T F
76. When you cough or sneeze if you turn your head away from the people to whom you are talking you need not cover your mouth with a handkerchief. T F
77. Tight clothes hinder the circulation of the blood. T F
78. The most important reason why you should change to dry shoes and stockings when your feet are wet (or should dry your shoes and stockings) is that wet shoes make tracks on the floor. T F
79. Girls who have always worn shoes that have low heels, broad toes and straight inside lines have prettier feet than girls who wear dainty, high heeled pumps. T F
80. Poison ivy leaves have five leaflets. T F
81. If you think you have been exposed to poison ivy, it is a good thing to wash with a strong laundry soap and hot water. T F
82. If you are putting out a bonfire, it is a good thing to cover the sparks with dust. T F
83. You should not use iodine or mercurochrome on cuts or scratches because they stain the skin. T F
84. It is all right to use your handkerchief to bandage a bleeding finger if you have only used the handkerchief two or three times. T F
85. A good baseball pitcher uses alcoholic drinks to make his pitching more accurate. T F
86. People who have weak hearts should use alcohol to stimulate them. T F
87. The worst result of smoking cigarettes is that it makes the fingers yellow. T F
88. Nicotine is a habit forming drug, and after you have formed the habit of using it, it is hard to stop. T F
89. When you get very angry, it may interfere with digestion. T F
90. When there is an epidemic of influenza, you are more likely to catch it by going to the movies than by playing ball outdoors. T F
91. When you are on a hike in the country it is all right to drink from any running stream if it looks clean and sparkling. T F
92. Being vaccinated is a good way to keep from having diphtheria. T F
93. Exchanging pencils with your friends, and putting pencils in your mouth is a way of spreading colds. T F
94. The reason why dairies pasteurize milk is to make the cream rise. T F
95. It is better to buy milk in bulk from the big milk cans than to buy bottled pasteurized milk, because bulk milk costs less. T F
96. You need not go to the dentist more than once a year because it costs too much. T F
97. The advertising that you see in magazines and on signs as to what is good for your health is always true. T F
98. If you are sick the best thing to do is to buy some medicine at the nearest drug store. T F
99. A plant that grows in a gloomy room is just as likely to have bright green leaves as one that grows in a sunny green-house, if you give them both the same amount of water. T F
100. Human life is not as dependent on sunshine, water and fresh air as plant life. T F

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Archery Repairs

(Continued from page 27)

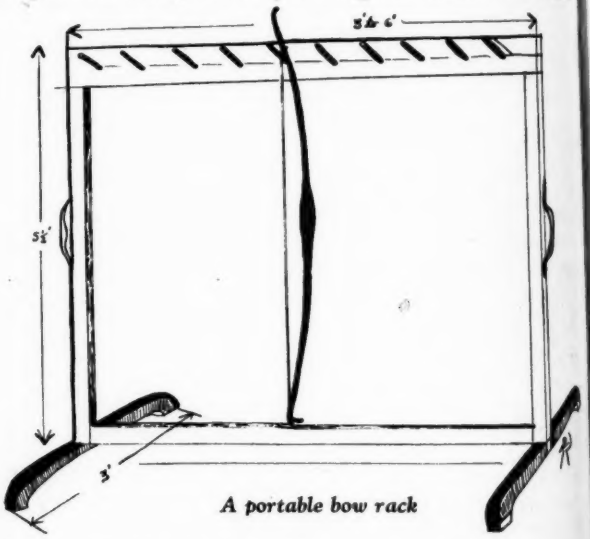
wear through in just a few shots. When a serving becomes loose or worn, replace it at once.

Heavy Bows

During the last few months I have visited a large number of colleges all over the country. I have been surprised to find how heavy most of the bows are which are in ordinary use. I have seen some that weigh up to thirty or thirty-five pounds and occasionally these heavy weights are used, not only for ordinary college girls, but for corrective classes as well. I believe that a twenty-five pound bow is the heaviest that should be employed in college use. If your bows are heavier, then they should be remodeled to a lighter weight. There are several manufacturers making a specialty of this repair work and the cost is moderate. It is a great deal better to have girls using bows from sixteen to twenty-five pounds in weight than to attempt to use heavier bows. The exercise in archery is only partially due to the effort of drawing the bow, and bows of moderate weight will give better results in the long run from every standpoint.

Portable Bow Rack

There is always a question of how to keep bows in proper condition, not only during the winter but in the



A portable bow rack

field house and on the shooting range as well. To my mind the simplest arrangement for this is a portable bow rack, as shown in the illustration. The dimensions shown are only approximate as this rack can be shortened or lengthened to accommodate the number of bows in use. The pegs are 3/8" wood dowels four inches long, and three or four bows can be hung on one peg, as illustrated. This rack will hold more bows than the average college has in its possession. The rack itself is not unwieldy and can be carried to and from the field by means of the handles. Be sure to use wooden dowels to hang the bows on, since any metal at this point will scratch and mar them. Not

only is this rack suitable for field use, but it will serve as a permanent storage rack for the winter. Just throw a large cloth over the bows to keep off the dust.

Notice the way the bows are hung. They are not hung horizontally, which frequently causes them to warp, but they are unbent and the string is hooked over the dowel in the rack at the upper loop.

The Ground Quiver

For outdoor shooting the ground quiver is the most satisfactory method of holding the arrows for the archer. These are made from ¼" cold rolled steel or plain iron rods which can be bent to the desired shape by any handy man. If it is desired to leave them permanently on the shooting field to mark the various distances, then 5/16" rods will be better as these are heavier and will stand more abuse.

Ground quiver

For carrying arrows to and from the archery field and keeping them in the winter, a tall fiber can is the best thing I know of. Another almost equally good arrangement is a square wooden box filled with mailing tubes. Then each set of arrows can be put into one mailing tube and the whole box carried to and from the shooting ground quite conveniently.

Target Faces

New target faces are so easily made or are so inexpensive, that it is inexcusable to begin the season without having a new face on each target. A 54-inch square of oil cloth can be used for the regulation target. The radius of the gold and the width of the rings is 4.8 inches each which gives exactly 48 inches in all to the outside of the white. If you paint these faces, use the colors ground in Japan mixed with turpentine. Add one teaspoonful of good varnish to each quart of turpentine, which will make the color stick on better in the rain and the paint will not stick to the arrows.

A quick way of making a target face is using wax crayons and coloring the back of the oil cloth instead of the face. An ordinary five cent box of wax crayons will probably be enough for the gold, red and blue rings; and one large black marking crayon will do for the black ring and the other circle of black around the edge of the white. These wax crayon target faces are not so brilliantly colored as the painted ones but, for that reason, it is easy to see the arrows in them. The target faces used at the national tournament are painted in pastel shades; this light coloring makes it much easier to distinguish the arrows at long distances.

I have not mentioned such simple matters as refinishing arrows and bows with a coat of shellac, inasmuch as almost anyone knows how to do this work. In case you find it necessary to do this, all dirt and rough spots are first to be removed with steel wool. Never use anything but pure white shellac, either on bows or arrows.

Septic Sores

SEPTIC sores occur with great frequency among athletes and they are very difficult to prevent.

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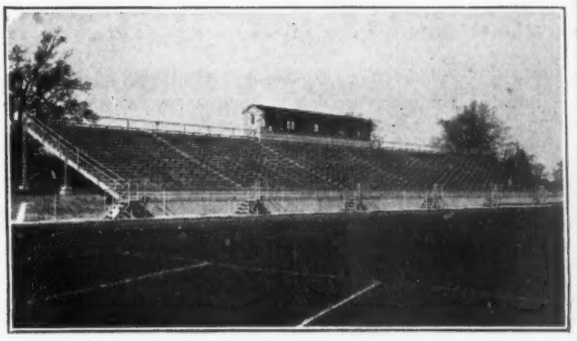

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New Books Received

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Determination of the Interrelations, Partial and Multiple, Between Various Anthropometric Measurements of College Women. Mary Louise Boillin, Ph.D. Bureau of Publications, Teachers College. 63 pp. $1.50.

This study indicates that height is not as reliable a determinant for weight expectancy as heretofore considered; that within certain age groups, certain other skeletal dimensions are of decidedly more value than height in determining how much a woman should be expected to weigh. Statistical treatment is employed on measurements of a group of more than eight hundred cases, and regression equations and multiples are offered.

Boxing Simplified. C. E. Kennedy, M.D., M.P.E. The Antioch Press, 75 pp. $2.00.

Would you like to be able to coach boxing without practical ring experience? This manual embodies the system of training for the boy scout, interested father, beginner, or the professional teacher. Contains well chosen illustrations in which the boxers are numbered and the drill counts given, long distance fighting, short distance fighting, effective drill combinations, and training and teaching hints. This is indeed "Boxing Simplified."

The Negro in Modern Industrial Society. Dean Dutcher, Ph.D. The Science Press, Lancaster, Pennsylvania. 137 p.

This represents an analysis of the changes in the occupations of negro workers from 1910 to 1920. The author sketches briefly the negro population trends since emancipation, presents a picture showing the process of redistribution into all parts of our industrial commonwealth and the negro's adjustment to industry. This study is of particular interest to those who desire to learn the character of the place which the negro holds in the complex maze of modern industry, or who wish basic material for their own particular problems in this limited field.

Educational Tests for Use in Institutions of Higher Learning. J. S. Kinder and Charles W. Odell. University of Illinois. Bulletin No. 49, August, 1930.

A number of standardized tests for measuring school achievement in colleges. After the introduction, the authors list the tests under the particular subject they are concerned with, giving the exact title, information as to the various parts or divisions and forms, a short description and criticism, time required to give the test, the name of the publisher, and price. A selected and annotated bibliography with 321 references is included.

Characteristic Rhythms for Children. Dudley Ashton. A. S. Barnes & Co. 45 pp. $.80.

Twenty-seven natural rhythm types with suggestions for basic ideas in the patterns of the movement. One feature of this book is the original music which has been written to fit the ability of the average child and is in a large and clear print. Excellent for the classroom and gymnasium teacher of kindergarten and the early grades.

Rural Schoolhouses, Schoolgrounds, and their Equipment. F. B. Dressler and Haskell Pruett. U. S. Dept. of Interior. Education Bulletin No. 21 (1930). 20 cents.

Contains suggestions for sanitary, well lighted, and properly ventilated schoolhouses which also are attractive in design. The need for modern schools in rural surroundings is emphasized not only from the standpoint of children, but from the important service as community centers. Many plans and diagrams.

Some Biting Remarks. Happy Goldsmith. A. S. Barnes & Co. 43 pp. $.75.

A unique book presenting principles of nutrition in a humorous way. There is a hope for the future for those who are constantly hungry if they appreciate the potentialities sufficiently to apply them. As for the ages of those who will read and enjoy this book, there is no limit. The colorful illustrations, the side notes, and the style itself are brimful of humor and purpose.

Songs for the School Year. George S. Dare. A. S. Barnes & Co. 174 pp. $1.20.

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Health Stories and Practice. William Burkhard, Ph.D., Raymond Chambers, Ph.D., and Frederick Maroney, M.D. Lyons and Carnahan. 256 pp.

A health reader for third grade. Has a most unique method of presentation. The authors have especially aimed to provide for the vital element of adequate habit formation together with the application of the health motives to health habits. An itemized list of habits in easily retainable form have been given at the end of each story. Contains 39 stories in large print, many colored illustrations, and concludes with excellent pupil and teacher suggestions.

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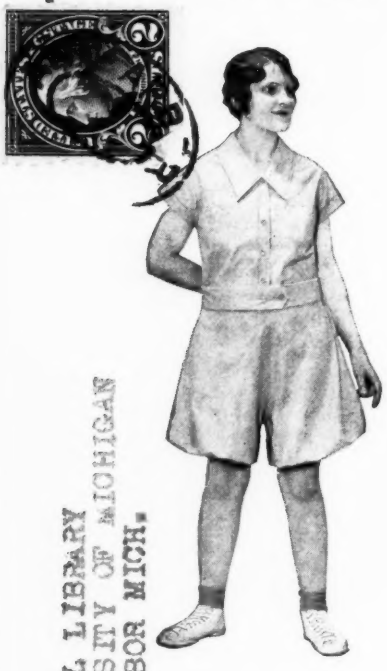

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